

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

List of Effective Pages

CHAPTER 21 - AIR CONDITIONING

CH-SE-SU	PAGE	DATE	CH-SE-SU	PAGE	DATE
21-LOEP	1/2	Jun.16	21-10-107	1	Jul.95
21-CONTENTS	1 thru 5	Jun.10		201/202	Jul.95
21-00-00	1 thru 3	Sep.05	21-10-155	1/2	Jul.95
21-10-00	1 thru 7	Sep.05		101	Jul.95
21-10-15	201 thru 203	Mar.08		201/202	Sep.05
21-10-20	1	Jun.10	21-10-165	1	Jul.95
	401/402	Jun.10		101	Jul.95
				201/202	Jul.95
21-10-21	1	Jun.10	21-10-195	201/202	Mar.06
	401/402	Jun.10	21-10-205	1 thru 4	Sep.03
21-10-24	1/2	Jul.95		401 thru 403	Sep.03
	101	Jul.95		501 thru 504	Sep.03
	201/202	Mar.02	21-30-00	1 thru 6	Dec.12
21-10-25	1/2	Jul.95		101 thru 109	Sep.14
	101	Jul.95		501 thru 505	Dec.12
	201/202	Mar.02	21-30-16	1 thru 3	Jul.95
21-10-26	1 thru 3	Apr.05		401/402	Sep.05
21-10-35	1 thru 4	Jul.95	21-30-25	1 thru 3	Mar.08
	401 thru 403	Jun.16		101	Jul.95
	501 thru 503	Sep.14		401	Mar.02
21-10-39	1	Jul.95		501	Jul.95
	201 thru 204	Jun.13		701	Mar.08
21-10-76	1 thru 3	Jul.95	21-30-35	1/2	Jul.95
	401 thru 403	Mar.02		101	Jul.95
	501/502	Dec.12		401	Mar.02
21-10-78	1	Jul.95	21-30-45	1	Jul.95
	201 thru 205	Sep.04		101	Jul.95
21-10-80	1	Mar.02		201/202	Mar.02
21-10-87	1/2	Jul.95	21-30-55	1	Dec.12
	101	Mar.08		101	Jul.95
	201 thru 218	Mar.08		201/202	Mar.02
21-10-95	1/2	Jul.95	21-30-65	1/2	Jul.95
	101	Jul.95		101	Jul.95
	401 thru 405	Dec.12		401	Mar.02
	501	Mar.08		501	Mar.02
	601 thru 605	Sep.06	21-30-70	201 thru 204	Mar.08
	701	Jul.95	21-30-85	401	Jul.95
	801/802	Sep.05	21-30-90	1	Feb.99
				401/402	Sep.08

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

CH-SE-SU	PAGE	DATE
21-30-95	1	Jul.95
	101	Jul.95
	401	Mar.02
21-30-105	1	Jul.95
	101	Jul.95
	401	Mar.02
21-30-115	1	Jul.95
21-30-125	1	Jul.95
21-30-136	401/402	Jul.95
	501/502	Jul.95
21-60-00	1 thru 5	Mar.09
	501 thru 503	Mar.02
21-60-16	1/2	Jul.95
	101	Jul.95
	501 thru 506	Jul.95
21-60-25	1 thru 3	Jul.95
	501/502	Jul.95
21-60-30	1	Jul.95
	501 thru 503	Jul.95
21-60-50	1	Jul.95
	201	Mar.02
21-60-57	1/2	Mar.09
	201 thru 205	Sep.05
21-60-60	1	Mar.09
	201/202	Mar.02
21-60-61	201/202	Dec.12
21-60-67	1/2	Jul.95
	101	Jul.95
	401	Mar.02
21-60-75	1	Jul.95
21-60-85	1	Jul.95
21-60-95	1	Jul.95
21-60-105	1/2	Jul.95
	101	Jul.95
	201	Sep.02
21-60-110	1	Jul.95

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

CHAPTER 21

AIR CONDITIONING

TABLE OF CONTENTS

<i>Subject</i>	<i>Ch-Se-Su</i>	<i>Page</i>
GENERAL		
AIR CONDITIONING	21-00-00	
General		1
DISTRIBUTION		
AIR SUPPLY AND DISTRIBUTION	21-10-00	
Description and Operation		1
PIPES AND DUCTING	21-10-15	
Maintenance Practices		201
DUCT LAGGING	21-10-20	
Description		1
Removal/Installation		401
DUCT LAGGING (REPLACEMENT CONFIGURATION)	21-10-21	
Description		1
Removal/Installation		401
MAIN AIR VALVE (RIGHT-HAND SIDE)	21-10-24	
Description and Operation		1
Trouble Shooting		101
Maintenance Practices		201
MAIN AIR VALVE (LEFT-HAND SIDE)	21-10-25	
Description and Operation		1
Trouble Shooting		101
Maintenance Practices		201
AIR VALVE (HP)	21-10-26	
Description and Operation		1
MIXING VALVE (LP/HP)	21-10-35	
Description and Operation		1
Removal/Installation		401
Adjustment/Test		501
LP pressure Switch	21-10-39	
Description and Operation		1
Maintenance Practices		201

21-CONTENTS

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

<i>Subject</i>	<i>Ch-Se-Su</i>	<i>Page</i>
DISTRIBUTION continued		
PRESSURE REGULATOR AND SHUT-OFF VALVE (PRSOV)	21-10-76	
Description and Operation		1
Removal/Installation		401
Adjustment/Test		501
PRSOV OVERPRESSURE SWITCH	21-10-78	
Description and Operation		1
Maintenance Practices		201
FLOW CONTROL VENTURI	21-10-80	
Description and Operation		1
ENVIRONMENTAL CONTROL UNIT (ECU)	21-10-87	
Description and Operation		1
Trouble Shooting		101
Maintenance Practices		201
WATER SEPARATOR	21-10-95	
Description and Operation		1
Trouble Shooting		101
Removal/Installation		401
Adjustment/Test		501
Inspection/Check		601
Cleaning/Painting		701
Repairs		801
NON-RETURN VALVE (MAIN SUPPLY)	21-10-107	
Description and Operation		1
Maintenance Practices		201
RAM AIR VALVE	21-10-155	
Description and Operation		1
Trouble Shooting		101
Maintenance Practices		201
NON-RETURN VALVE (RAM AIR SUPPLY)	21-10-165	
Description and Operation		1
Trouble Shooting		101
Maintenance Practices		201
SHUT-OFF VALVE (APU SUPPLY)	21-10-195	
Maintenance Practices		201
BAGGAGE PANNIER HEATING	21-10-205	
Description and Operation		1
Removal/Installation		401
Adjustment/Test		501

21-CONTENTS

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

<i>Subject</i>	<i>Ch-Se-Su</i>	<i>Page</i>
PRESSURIZATION CONTROL		
PRESSURIZATION CONTROL	21-30-00	
Description and Operation		1
Trouble Shooting		101
Adjustment/Test		501
OUTFLOW/SAFETY VALVE CONTROLLER	21-30-16	
Description and Operation		1
Removal/Installation		401
OUTFLOW/SAFETY VALVE	21-30-25	
Description and Operation		1
Trouble Shooting		101
Removal/Installation		401
Adjustment/Test		501
Cleaning/Painting		701
PNEUMATIC RELAY	21-30-35	
Description and Operation		1
Trouble Shooting		101
Removal/Installation		401
AIR JET PUMP	21-30-45	
Description and Operation		1
Trouble Shooting		101
Maintenance Practices		201
PRESSURE REGULATOR	21-30-55	
Description and Operation		1
Trouble Shooting		101
Maintenance Practices		201
FAN OPERATED VENTURI	21-30-65	
Description and Operation		1
Trouble Shooting		101
Removal/Installation		401
Adjustment/Test		501
ALTITUDE WARNING SWITCH	21-30-70	
Maintenance Practices		201
GROUND PRESSURE TEST VALVE	21-30-85	
Removal/Installation		401
CABIN TRIPLE INDICATOR	21-30-90	
Description and Operation		1
Removal/Installation		401

21-CONTENTS

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

<i>Subject</i>	<i>Ch-Se-Su</i>	<i>Page</i>
PRESSURIZATION CONTROL continued		
MANUAL CABIN ALTITUDE CONTROL VALVE	21-30-95	
Description and Operation		1
Trouble Shooting		101
Removal/Installation		401
VENTURI	21-30-105	
Description and Operation		1
Trouble Shooting		101
Removal/Installation		401
CABIN AIR FILTER	21-30-115	
Description and Operation		1
CHECK VALVE	21-30-125	
Description and Operation		1
DUMP VALVE AND CONTROL MECHANISM	21-30-136	
Removal/Installation		401
Adjustment/Test		501
TEMPERATURE CONTROL		
TEMPERATURE CONTROL	21-60-00	
Description and Operation		1
Adjustment/Test		501
TEMPERATURE CONTROLLER	21-60-16	
Description and Operation		1
Trouble Shooting		101
Adjustment/Test		501
TEMPERATURE CONTROL SELECTOR	21-60-25	
Description and Operation		1
Adjustment/Test		501
CABIN TEMPERATURE SENSOR	21-60-30	
Description and Operation		1
Adjustment/Test		501
BLEED AIR OVER-TEMPERATURE SWITCH	21-60-50	
Description and Operation		1
Maintenance Practices		201
LOW-LIMIT TEMPERATURE CONTROL VALVE	21-60-57	
Description and Operation		1
Maintenance Practices		201

21-CONTENTS

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

<i>Subject</i>	<i>Ch-Se-Su</i>	<i>Page</i>
TEMPERATURE CONTROL continued		
LOW-LIMIT TEMPERATURE CONTROL SENSOR	21-60-60	
Description and Operation		1
Maintenance Practices		201
LOW-LIMIT TEMPERATURE CONTROL VALVE FILTER	21-60-61	
Maintenance Practices		201
CABIN TEMPERATURE CONTROL VALVE	21-60-67	
Description and Operation		1
Trouble Shooting		101
Removal/Installation		401
DUCT TEMPERATURE SENSOR	21-60-75	
Description and Operation		1
DUCT OVER-TEMPERATURE SWITCH	21-60-85	
Description and Operation		1
DUCT AND CABIN TEMPERATURE DETECTORS	21-60-95	
Description and Operation		1
AUXILIARY HEATING VALVE	21-60-105	
Description and Operation		1
Trouble Shooting		101
Maintenance Practices		201
WATER INJECTION NOZZLE	21-60-110	
Description and Operation		1

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING

AIR CONDITIONING GENERAL

1. INFORMATION

NOTE: Table 1 contains references to data and information contained in Chapter 21. All procedures are to be completed in accordance with the Aircraft Maintenance Manual.

Table 1
Index of Information

Title	ATA Number	Paragraph Heading	Paragraph/Data/Information
Air Supply and Distribution	21-10-00-001	Main System	Mixing valve HP air outlet temperature 392°F (200°C).
		Indication	MWS HP AIR 1 and 2 O/HEAT come ON at 554°F (290°C). MWS REAR BAY/OVHT come ON at 212°F (100°C) MWS DUCT O/HEAT come ON at 239°F (115°C)
Main Air Valve (Right Hand Side)	21-10-24-001	Data	Max operating time open/close 1 sec. at 28 Vd.c. with 5 lbf load.
Main Air Valve (Left Hand Side)	21-10-25-001	Data	Max operating time open/close 10 to 14 seconds.
Mixing Valve (LP/HP)	21-10-35-001	Data	Check valve operation: Max crack pressure 0.2 psi. High stage pressure regulator: Minimum opening pressure 14 psi. Outlet pressure with high stage open 18 to 22 psi. Temperature compensation mode operation normally 392°F (200°C).
LP Pressure Switch	21-10-39-001	Description	Close at 27± 2 psi (falling pressure). Open at 30 psi (rising pressure).
Over-Pressure Switch	21-10-78-001	Operation	Close at 40 ± 2 psi (rising pressure).
Environmental Control Unit	21-10-87-001	Description	Minimum outlet temperature 35°F (1.7°C).
Ram Air Valve	21-10-155-101	Data	Operating time 7 to 13 seconds at 40 to 120°F (4.4 to 49°C).
Shut-Off Valve (APU Supply)	21-10-195-201	Checks /Tests after installation	Operating time 10 to 14 seconds.
Baggage Pannier Heating	21-10-205-001	Operation	Baggage pannier heat shut-off valve operates when cabin conditioning inlet temp. is less than 60°F(16°C).

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

Table 1
Index of Information

Title	ATA Number	Paragraph Heading	Paragraph/Data/Information
Pressurization Control	21-30-00-001	Description	Max cabin differential pressure 8.65 ± 0.10 psi. Max safety cabin altitude $13,500 \pm 1,500$ ft. Cabin altitude warning horn $9,300 \pm 300$ ft. (Mod. 259747C) Cabin High Datum annunciator switch $14,000 \pm 300$ ft.
Outflow/Safety Valve Controller	21-30-16-001	Data	Rate of change control 175 to 2,500 ft/min. Calibration point 500 ft/min.
Outflow/Safety Valve	21-30-25-001	Data	Pressure differential setting 8.65 ± 0.1 psi.
Pressure Regulator	21-30-55-001	Data	Maximum altitude setting 13500 ± 1500 ft.
Cabin Triple Indicator	21-30-90-001	Description	Max rate of change of cabin altitude 2,000 ft/min. Max indication of cabin differential pressure 10.5 psi.
Temperature Control Selector	21-60-25-001	Data	Potentiometer: Resistance $1,000 \pm 55$ ohms . Function angle $270^\circ + 0^\circ - 1^\circ$.
Cabin Temperature Sensor	21-60-30-001	Data	Total resistance at 77°F (25°C) 4002 ± 120 ohms
Bleed Air Over-Temperature Switch	21-60-50-001	Operation	Switch contacts close $554 \pm 9^\circ\text{F}$ ($290 \pm 5^\circ\text{C}$).
Low-Limit Temperature Control Valve	21-60-57-001	Operation	Low-limit control valve sensed temperature $36 \pm 2^\circ\text{F}$ ($2.2 \pm 1.1^\circ\text{C}$).
Low-Limit Temperature Control Sensor	21-60-60-001	Operation	Water separator minimum outlet control temperature to $36 \pm 2^\circ\text{F}$ ($2.2 \pm 1.1^\circ\text{C}$).
Cabin Temperature Control Valve	21-60-67-001	Data	Operating time 10 to 14 seconds.
Duct Temperature Sensor	21-60-75-001	Data	Resistance: 39 to 41°F (3.89 to 5°C) 4678 ohms 76 to 78°F (24.44 to 25.56°C) 2001 ohms 119 to 121°F (48.33 to 49.44°C) 841 ohms
Duct Over-Temperature	21-60-85-001	Data	Operating Temperature $222 \pm 10^\circ\text{F}$ ($105.6 \pm 5.6^\circ\text{C}$).
Auxiliary Heating Valve	21-60-105-001	Data	Operating time 7 to 13 seconds.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

2. GENERAL

NOTE: For information on the air supply and distribution system (Ref. 21-10-00, 001).

A three wheel environmental control unit (ECU) supplies air for ventilation and pressurization of the flight and passenger compartments. Air delivered by the engine compressors is fed into the flight and passenger compartments, through the ECU, at a controlled flow rate and temperature.

An auxiliary system, which gets its air supply from the No.2 engine compressor, is provided to supplement the flight compartment heating supply.

The pressure control system and the outflow safety valves control the release of the air to ambient and keep the required cabin altitude.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION AIR SUPPLY AND DISTRIBUTION DESCRIPTION AND OPERATION

1. INFORMATION

A. General

Bleed air from the low pressure (LP) and high pressure (HP) compressor pass through flow limiting venturis on the engine to supply the main system and the flight compartment auxiliary system (Figure 1, Sheet 1 and Sheet 2).

Supplies are taken at the entry of each engine supply to the rear equipment bay for the pressurization control air jet pump, and hydraulic tank pressurization (Ref. 29-00-00, 001).

Supplies for the rudder bias system are taken directly from the LP bleed of each engine and also from the LP duct at the LP inlet to the mixer valve (Ref. 27-20-00, 001).

2. DESCRIPTION

A. Main System

NOTE: For further information on the cabin air and flight deck distribution system (Ref. MMA-800XP, 21-20-05, 001).

Air bled from each engine HP and LP compressor is ducted through flow limiting venturies to a mixing valve for that engine.

The mixing valve uses HP air to supplement LP air at low engine speeds. The HP air valve is controlled by the applicable MAIN AIR VLV switch and a pressure switch located in the LP supply to the mixer valve. The pressure switch is connected to close the HP air valve when sufficient LP air is available.

When HP air is required to supplement LP air, the mixing valves will automatically regulate the flow of HP air to the mixing valve outlet. The mixing valve will further limit the flow of HP air if the air temperature at the valve outlet reaches 392° F (200° C).

Air from each mixing valve is fed into a common supply duct through an electrically actuated main air valve and a non-return valve. The main air valves are controlled from the applicable MAIN AIR VLV switch on roof panel CG. Electrical time delay units are used to progressively open the left-hand main air valve and to prevent the right-hand main air valve opening until the left-hand valve is almost fully open. This is done to prevent an initial surge of air in to the cabin. The valves are not delayed during the close operation.

Air flow through the main supply duct is controlled by a pressure regulator and shut off valve, and a flow control venturi which automatically limits the amount of air delivered to the air conditioning pack at a pre-determined flow rate. The flow control venturi has three pressure sensing pipes, one goes to the pressure regulator and shut-off valve, one to the over pressure switch and one to the low limit temperature control valve.

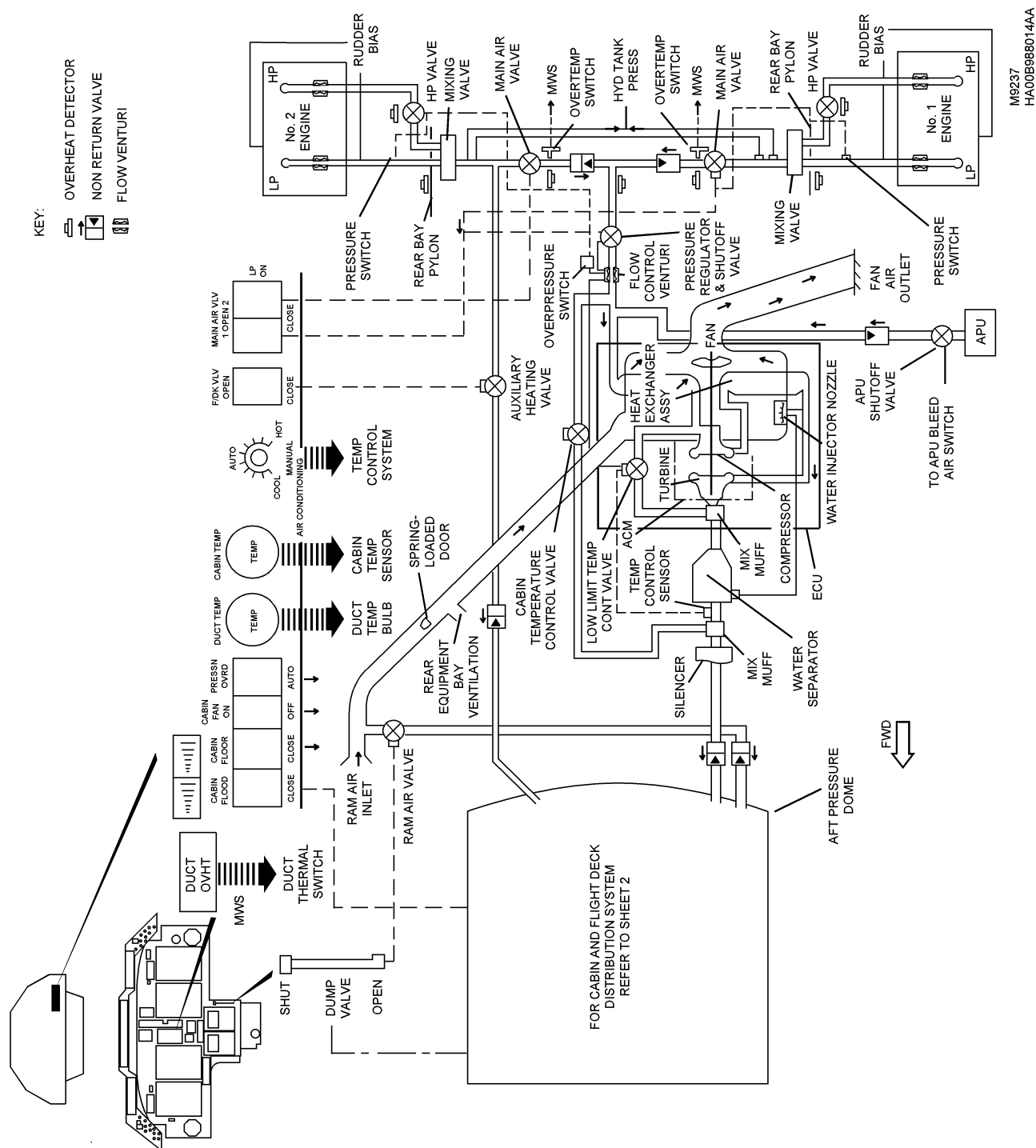
The controlled airflow can be supplied to the pressurized area of the fuselage through:

- (1) The environmental control unit (ECU).
- (2) The cabin temperature control valve.
- (3) The low limit temperature control valve.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

(4) A combination of (1), (2) and (3).



M9237
HA00B988014AA

Figure 1 (Sheet 1 of 2)
Air Supply and Distribution System - Schematic

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



21-10-00

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

The air is passed through the dual heat exchanger and partially cooled by ram (ambient) air from the dorsal fin intake and is further cooled on passing through the turbine in the environment control unit (ECU).

From the ECU the air is fed through a water separator where a large percentage of its moisture content is removed before it goes into the main supply duct. To prevent the water freezing in the water separator, warm air is routed directly from the primary heat exchanger outlet through the low limit temperature control valve and into a mixing muff immediately before the water separator.

The water in the water separator is injected into the ram air duct and the cold air unit to increase the heat exchange cooling effect.

The water separator outlet air is heated by the ECU by-pass air which enters a mixing muff in the main supply duct between the water separator and the silencer, the flow is controlled by the cabin temperature control valve.

Temperature controlled air enters the pressure cabin through a silencer, a non-return valve and an electrically-operated two-way valve which is controlled by a FLOOD-OPEN-CLOSE switch on roof panel CG. With FLOOD-OPEN selected, temperature controlled air is supplied to the cabin flood flow outlet (Figure 1, Sheet 1).

On airplanes with a baggage pannier installed (Mod.25F737A/B/C), air is taken from a shut-off valve from a tapping down stream of the silencer duct. This is then routed through two pipelines to distribute heat to the pannier (PANNIER HEATING). Air is exhausted from the pannier through a second shut-off valve.

With FLOOD-CLOSE selected, the air supply to the cabin flood flow outlet is stopped and temperature controlled air is supplied to the cabin side ducts which supply the ankle outlet grilles at floor level and high level outlets.

Cabin air exhausts through the cabin floor into underfloor ducts, and is vented to atmosphere through the pressurization outflow/safety valves on the rear pressure bulkhead.

B. Auxiliary System

The auxiliary system supplies the flight compartment with a variable supply of hot air through a heat augmentor in the main supply system. Control of the auxiliary heating system valve is by F/DK VLV OPEN-CLOSE switch on roof panel CG, the supply is taken from upstream of the main air valve of No.2 engine (Figure 1, Sheet 2).

Ram air from the dorsal air intake is used for cooling the ECU heat exchanger and can also be introduced into the unpressurized cabin for ventilation. The cabin supply is ducted from the intake and fed into the cabin through an electrically operated ram air valve and a check valve into the flood flow duct. The ram air valve is controlled by a microswitch which operates when the DUMP VALVE is selected fully OPEN.

The ram air passing through the refrigeration unit heat exchanger, assisted by a fan driven by the refrigeration unit turbine, is ducted to atmosphere through a grille above the left pylon. A silencing arrangement (venturi) is built into a portion of the duct.

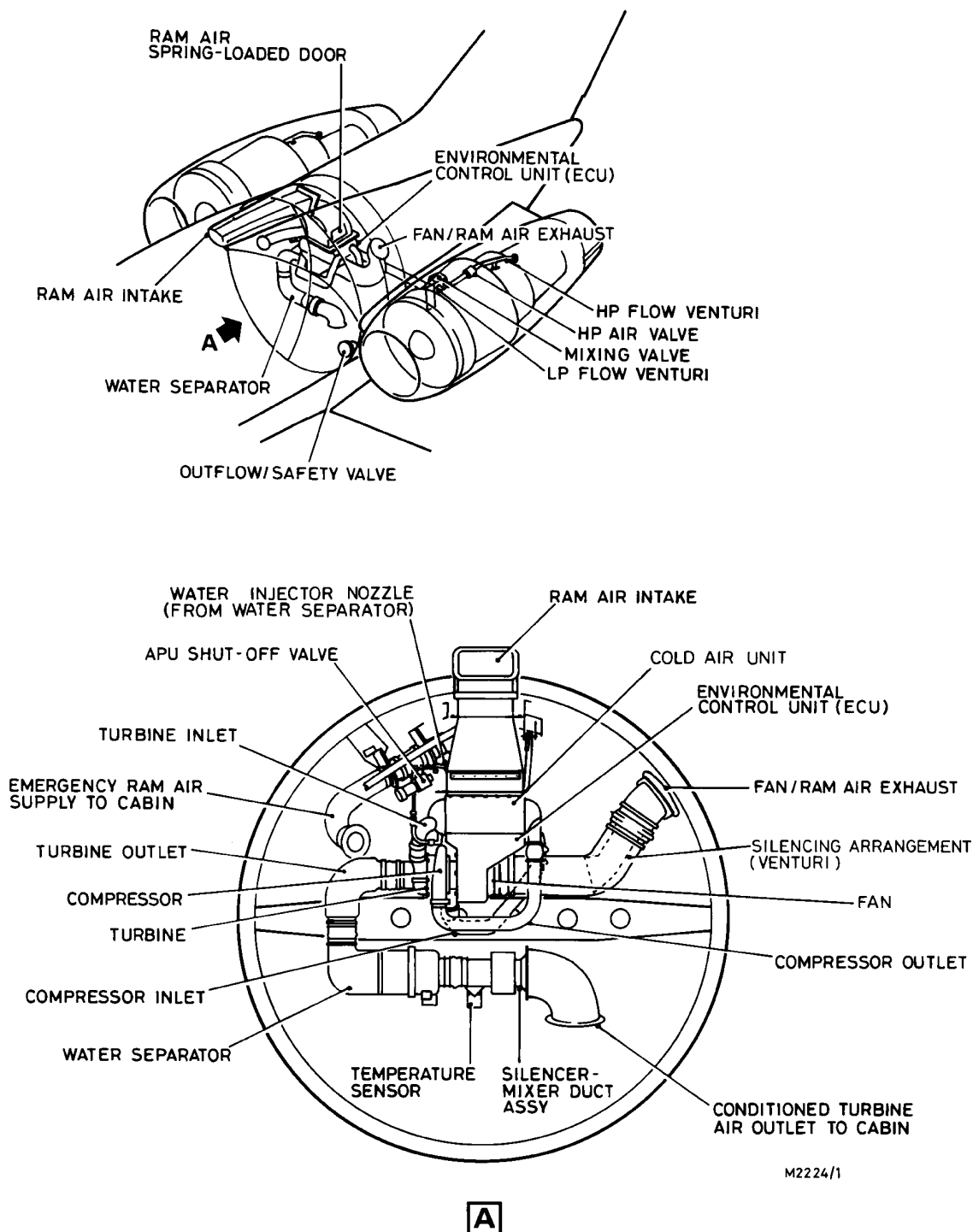
In the event of the intake becoming obstructed, a spring-loaded door in the intake duct opens inwards to permit air from the rear equipment bay to enter the intake and supply the ECU heat exchanger.

C. Rear Equipment Bay Ventilation

An air supply is taken from the dorsal fin air intake duct for rear equipment bay ventilation (Figure 2 and Figure 3).

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



M2224/1

Figure 2
Part Air Conditioning System in Rear Equipment Bay

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

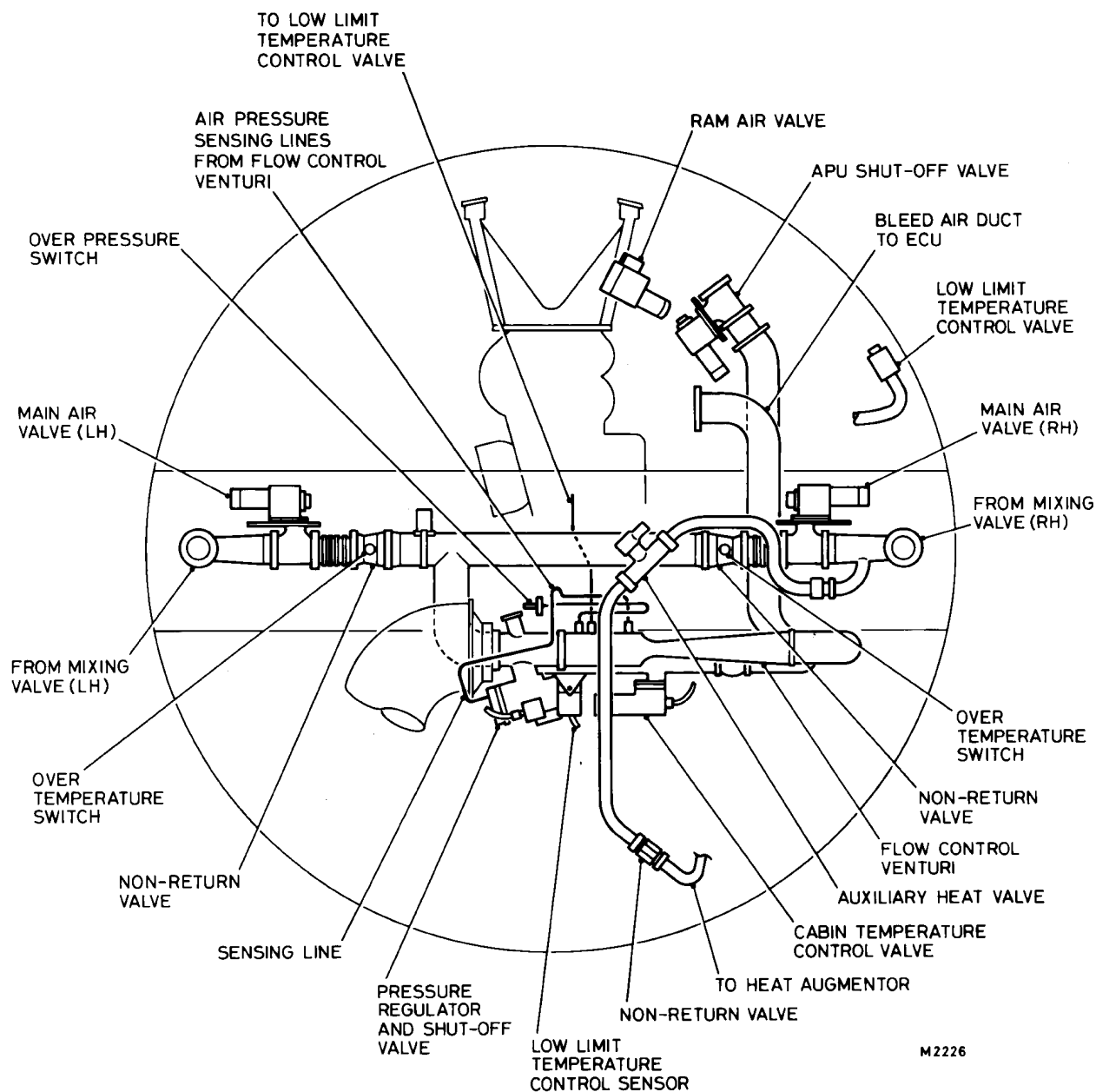


Figure 3
Part Bleed Air System in Rear Equipment Bay

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

D. Ground Air Conditioning

The auxiliary power unit (APU) is used for ground air conditioning. The APU air supply is fed into the main supply duct downstream of the flow control venturi through an electrically-operated shut-off valve and a non return valve. The APU is controlled from the APU control panel (Ref. 49-01-00, 001 or Ref. 49-60-03, 001).

E. Indication

The air supply is monitored and the following warnings will appear on the MWS panel in the center instrument panel:

- (1) Red annunciators, HP AIR 1 - O/HEAT and HP AIR 2 - O/HEAT come on when actuated by over temperature switches, set at 554° F (290° C), installed in each duct between the main air valve and non-return valve.
- (2) Red annunciator REAR BAY/OVHT, comes on when actuated by detectors set at 212° F (100° C), in the rear equipment bay (Ref. 26-10-00, 001).
- (3) Amber annunciators MAIN AIR VALVE 1 and MAIN AIR VALVE 2 come on when the associated valve is open on the ground, and also come on in flight when the valve is not in the position selected.
- (4) Amber annunciator DUCT O/HEAT comes on when actuated by an over temperature switch, set at 239° F (115° C), installed in the main supply duct between the silencer and non-return valve at the pressure bulkhead. This switch also operates the overheat system (Ref. 21-60-00, 001).

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION PIPES AND DUCTING MAINTENANCE PRACTISES

1. INFORMATION

Equipment/Materials	Part/Item No.
Torque wrench 20 to 50 lb in. (2.26 to 5.65 Nm)	Local Supply

2. REMOVAL/INSTALLATION

A. General

NOTE: The following operations are applicable whenever ducting or components are removed and installed.

	MECH	INSP
(1) Disconnect couplings and/or slacken hose clamps before slackening supports (Ref. Figure 201).		
(2) Adequately support ducting and components during removal and installation.		
(3) Blank off any ducts or components left open after disconnection operations.		
(4) Prior to installation, make sure the absolute cleanliness of ducts, mating flanges and components.		
(5) Do a check of the seals for damage and deterioration.		
(6) Make sure that mating flanges are smooth and flat.		
(7) Make sure that joint mating flanges are mated and in alignment.		
(8) Make sure that the duct lagging has not deteriorated and is firmly secured.		
(9) Connect any electrical bonding that has been disconnected during dismantling operations (Ref. AMM, 125/H-20, 20-10-5016, 201).		
(10) Make sure that ducting is correctly clamped or bracketed to adjacent structure, and that no chafing is likely to occur.		
(11) Make sure that ducting and securing clamps are clear of all control cables and cable adjusters, when controls are operated through their full range.		
(12) Make sure that ducts are not under strain when clamped.		
(13) Torque load hose clamps of LP and HP bleed air supply ducts, located in left and right-hand pylons to 35 to 45 lb in. (3.95 to 5.08 Nm).		
NOTE Torque load V-clamps of LP and HP bleed air supply ducts, located in left and right pylons to 35 to 45 lb in. (3.95 to 5.08 Nm).		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(14) Torque load hose clamp securing bolts to 25 to 30 lb in. (2.82 to 3.39 Nm) except where specific torque loadings are quoted in individual maintenance practices.		

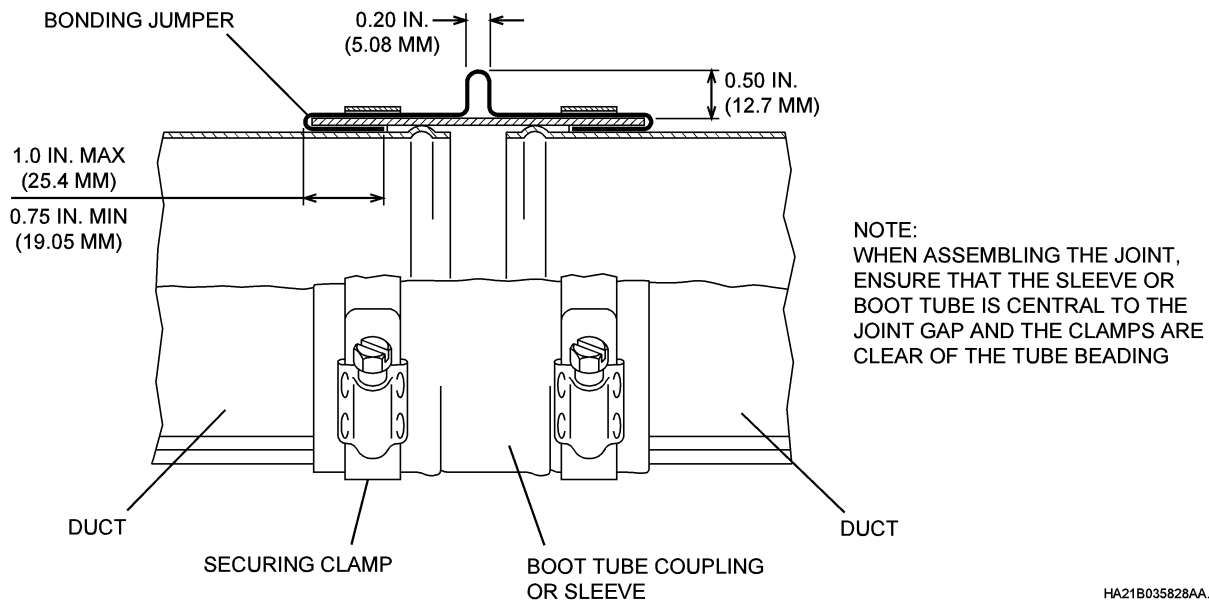


Figure 201
Electrical Bonding - Flexible Joint

B. Leak test After Installation

WARNING: Any air leaks from the disturbed joints will be at high temperature. Be careful when examining for leaks by feel of hand.

- (1) Do a test of the air conditioning system to examine for leaks at the joints disturbed:
 - (a) Energize the airplane busbars (Ref. 24-01-00, 201).
 - (b) Start both engines and run at idle (Ref. 71-00-00, 501) OR start the PATS APU (Ref. 49-11-00, 501) or the Turbomach APU (Ref. 49-16-00, 501).
 - (c) If the engine supply is being used, on the overhead panel "CG", set the related MAIN AIR VALVE switch to the OPEN position and make sure the relevant MAIN AIR VALVE annunciator comes "ON".
 - (d) If APU BLEED supply is used, on the APU CONTROL PANEL, set BLEED AIR SWITCH to ON position and make sure the BLEED AIR ON annunciator comes "ON".
 - (e) Pressurize the cabin to max differential pressure (Ref. 21-30-00, 501).

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (f) Open the rear equipment bay door, REAR BAY DOOR annunciator comes "ON".
- (g) Examine the disturbed joints for leaks by feel of hand.
- (h) De-pressurize the airplane (Ref. 21-30-00, 501).
- (i) If the engine supply is being used, on the overhead panel "CG", set the related MAIN AIR VALVE switch to the CLOSE position and make sure the relevant MAIN AIR VALVE annunciator goes "OUT".
- (j) If APU BLEED supply is used, on the APU CONTROL PANEL, set BLEED AIR SWITCH to OFF position and make sure the BLEED AIR ON annunciator goes "OUT".
- (k) Stop the engines (Ref. 71-00-00, 501) OR stop the PATS APU (Ref. 49-11-00, 501) or the Turbomach APU (Ref. 49-16-00, 501).
- (l) Close the rear equipment bay door, REAR BAY DOOR annunciator goes "OUT".
- (m) De-energize the airplane busbars (Ref. 24-01-00, 201).

C. Close Up

- (1) Make sure the work area is clean and clear of tools and other equipment.

D. Install engine LP air connector on left or right engine

- (1) Install a new sealing gasket.
- (2) Install connector with bolts and torque-tighten bolts to 25 to 30 lb in. (2.82 to 3.39 Nm).

E. Install engine HP air connector on left or right engine

- (1) Install a new sealing gasket.
- (2) Install pipe with washers and bolts. Torque tighten bolts to 20 to 25 lb in. (2.26 to 2.82 Nm) and wire-lock.

3. APU BLEED DUCTING (TURBOMACH APU)

A. General

- (1) Generally check the condition of the APU bleed ducting for signs of deterioration and damage. Make sure the six clamping bolts of the adjustable joints are securely attached.
- (2) Leak checks of the ducting are performed while the APU is being run, (Ref. 49-16-00, 501). Leaks from a secure duct joint are permissible provided they are not so excessive that a rise in the local air temperature can be detected by hand.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION DUCT LAGGING DESCRIPTION

1. DESCRIPTION

The lagging on the air conditioning ducts consists of unbonded one inch thick fibreglass filling covered with aluminium foil/glass tape. (Ref. Figure 1).

The heat from the engine hot air which operates the air-conditioning/pressurization system is kept in the ducting by the lagging to prevent an overheat condition in the rear equipment bay. The lagging must be kept in good condition to prevent deterioration of other components in the rear equipment bay.

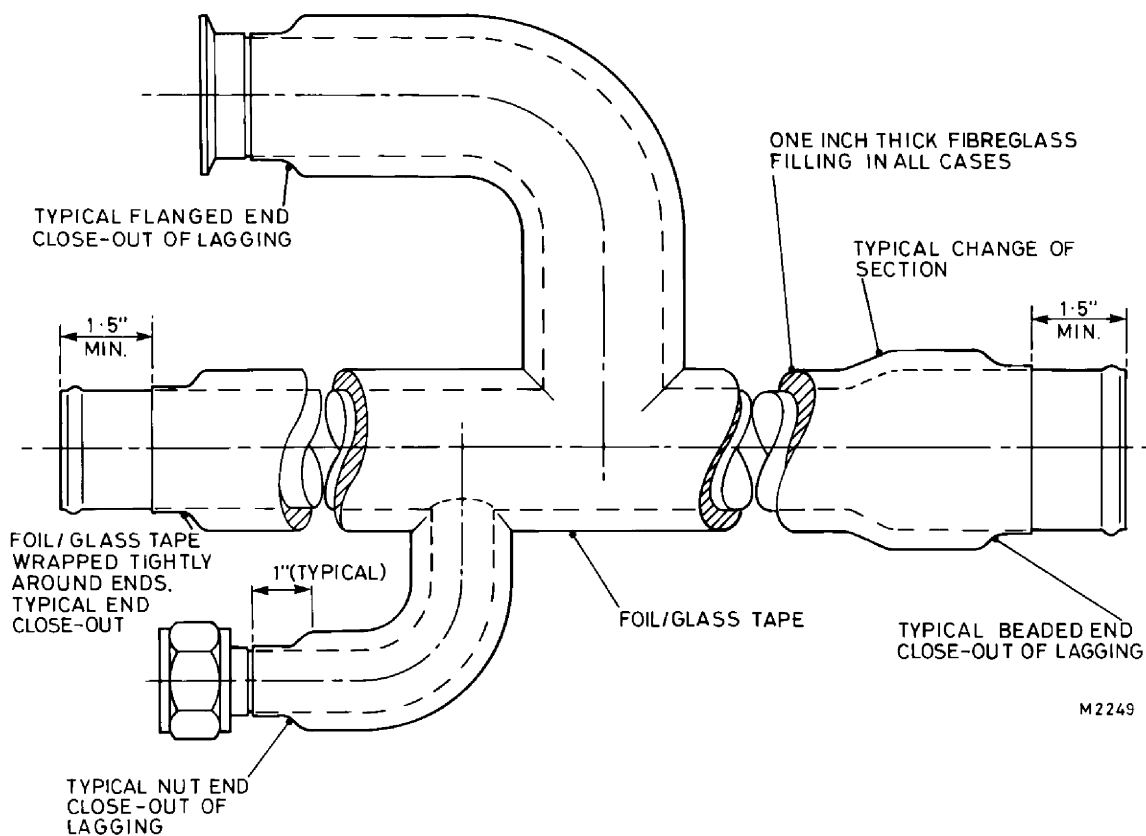


Figure 1
Typical Lagging Arrangement

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION DUCT LAGGING REMOVAL/INSTALLATION

1. INFORMATION

WARNING: Wear protective clothing and eye protection when removing and installing the fiberglass filling and the foil/glass tape.

Equipment/Material	Part/Item No.
Aluminum foil reinforced tape (glass cloth/silicone)	618 (Ref. AMM 125/H-20, 20-95-601)
Adhesive	376 (Ref. AMM 125/H-20, 20-95-301)
Insulation lagging (fiberglass filling)	609A (Ref. AMM 125/H-20, 20-95-601)

NOTE: The materials cited above may be used for any repair of the insulation duct lagging.

2. REMOVAL/INSTALLATION

A. Removal

CAUTION: When sharp tools are used to remove the lagging, make sure you do not score or damage the metal duct.

	MECH	INSP
(1) Use a sharp tool and cut off the aluminum foil reinforced tape (glass cloth/silicone).		
(2) Cut the fiberglass filling horizontally along the duct and remove the filling.		
(3) Make sure the duct has no damage.		

B. Installation

	MECH	INSP
NOTE When replacing the duct lagging installation shall be done in accordance with 21-10-21, 401 instructions. When repairing the duct lagging proceed as follows:		
(1) Make sure the duct joints are secure.		
(2) Wrap a one-inch layer of fiberglass filling (Item 609A) around the duct and use adhesive (Item 376) to secure the joint.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(3) Wrap a layer of aluminum foil reinforced tape (glass cloth/silicone) (Item 618) around the fiberglass filling and overlap each wind by 50%.		
NOTE If non-adhesive aluminum foil reinforced tape (glass cloth/silicone) is used (Item 618), put a layer of adhesive (Item 376) on the tape before winding the tape on to the fiberglass filling.		
(4) Make sure the duct lagging is secure.		

C. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION DUCT LAGGING (REPLACEMENT CONFIGURATION) DESCRIPTION

1. DESCRIPTION

NOTE: This configuration is only applicable when the duct lagging is being or has been replaced.

The lagging on the air conditioning ducts consists of unbonded one inch thick fiberglass filling, wrapped in a criss-cross pattern with safety wire with a single wrap at each end, which is covered with PVF tape (Ref. Figure 1).

The heat from the engine hot air which operates the air-conditioning/pressurization system is kept in the ducting by the lagging to prevent an overheat condition in the rear equipment bay. The lagging must be kept in good condition to prevent deterioration of other components in the rear equipment bay.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

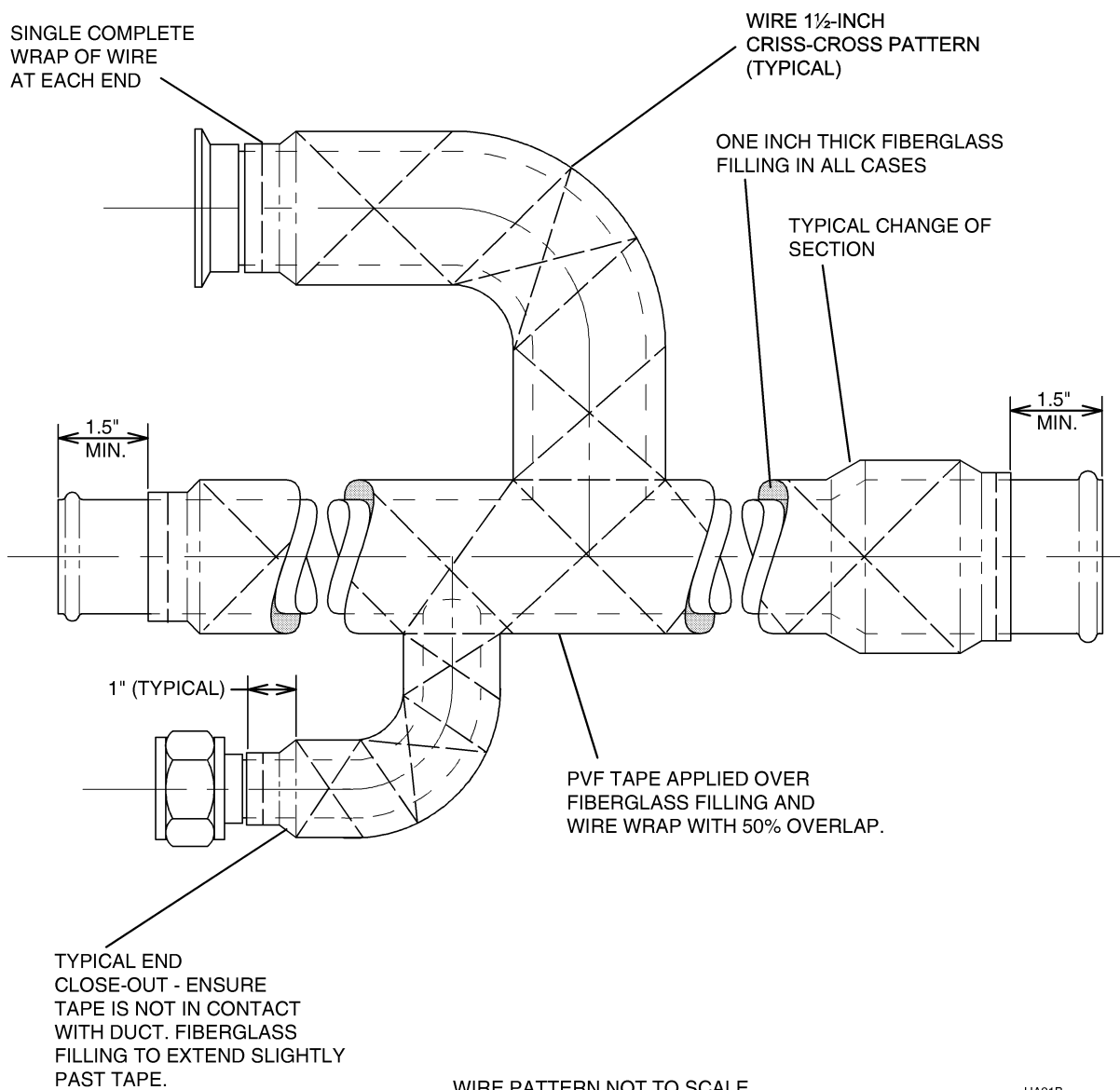


Figure 1
Typical Lagging Arrangement

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION DUCT LAGGING (REPLACEMENT CONFIGURATION) REMOVAL/INSTALLATION

1. INFORMATION

WARNING: Wear protective clothing and eye protection when removing and installing the insulation lagging and the PVF tape.

This section contains instructions to introduce enhanced fire retardant lagging to be used when replacement of the lagging is necessary.

Equipment/Material	Part/Item No.
PVF tape	608A (Ref. AMM 125/H-20, 20-95-601)
Wire, corrosion resistant	651 (Ref. AMM 125/H-20, 20-95-601)
Insulation lagging (fiberglass filling)	609A (Ref. AMM 125/H-20, 20-95-601)

2. REMOVAL/INSTALLATION

A. Removal

CAUTION: When sharp tools are used to remove the lagging, make sure you do not score or damage the metal duct.

	MECH	INSP
(1) Using a suitable sharp tool, cut off the protective tape covering the lagging and duct and separate.		
(2) Cut the wire securing fiberglass lagging in place and discard.		
(3) Cut the fiberglass lagging horizontally along the duct and remove.		
(4) Make sure the duct has no damage.		

B. Installation

	MECH	INSP
(1) Make sure the duct joints are secure.		
(2) Wrap a one-inch layer of fiberglass filling (Item 609A) around the duct.		
(3) Wrap wire (Item 651) in a criss-cross pattern 1.5 inches between patterns across the entire insulation lagging material with a complete single wrap at each end.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(4) Install PVF tape (Item 608A), wrapping around duct with at least a 50% overlap.		
NOTE At each end, ensure the tape is not in contact with the duct. A small amount of insulation lagging is to extend past the tape.		

C. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

MAIN AIR VALVE (RIGHT-HAND SIDE) - DESCRIPTION AND OPERATION

1. Description *(Figure 1)*

The right-hand main air valve is an electrically actuated butterfly valve operated by an electrical rotary actuator. It comprises a valve housing enclosing the butterfly assembly which is attached to the single motor actuator by a v-clamp fitted around mounting flanges on each assembly. A position indicator on the top cover of the actuator which can be seen or felt is provided to determine the position of the butterfly valve.

2. Operation

Operation of the MAIN AIR VALVE 2 selector switch enables the butterfly valve to assume the open or closed position to control the supply of air to the cabin air conditioning system.

When the valve is selected OPEN or LP ON through the MAIN AIR VALVE 2 switch, the 28 v d.c. supply energizes the motor through a 30 second time delay circuit and the open limit switch. The drive is transmitted through the gear train to the output shaft. When the output shaft reaches its preset limit of rotation, a trip operates the 'open' limit switch, de-energizes the motor and operates the 'open' indication switch.

Operation of the 'close' limit switch when the valve is selected to CLOSE is similar to that described for the 'open' switch.

The MAIN AIR VALVE 2 annunciator on the MWS panel comes on when:

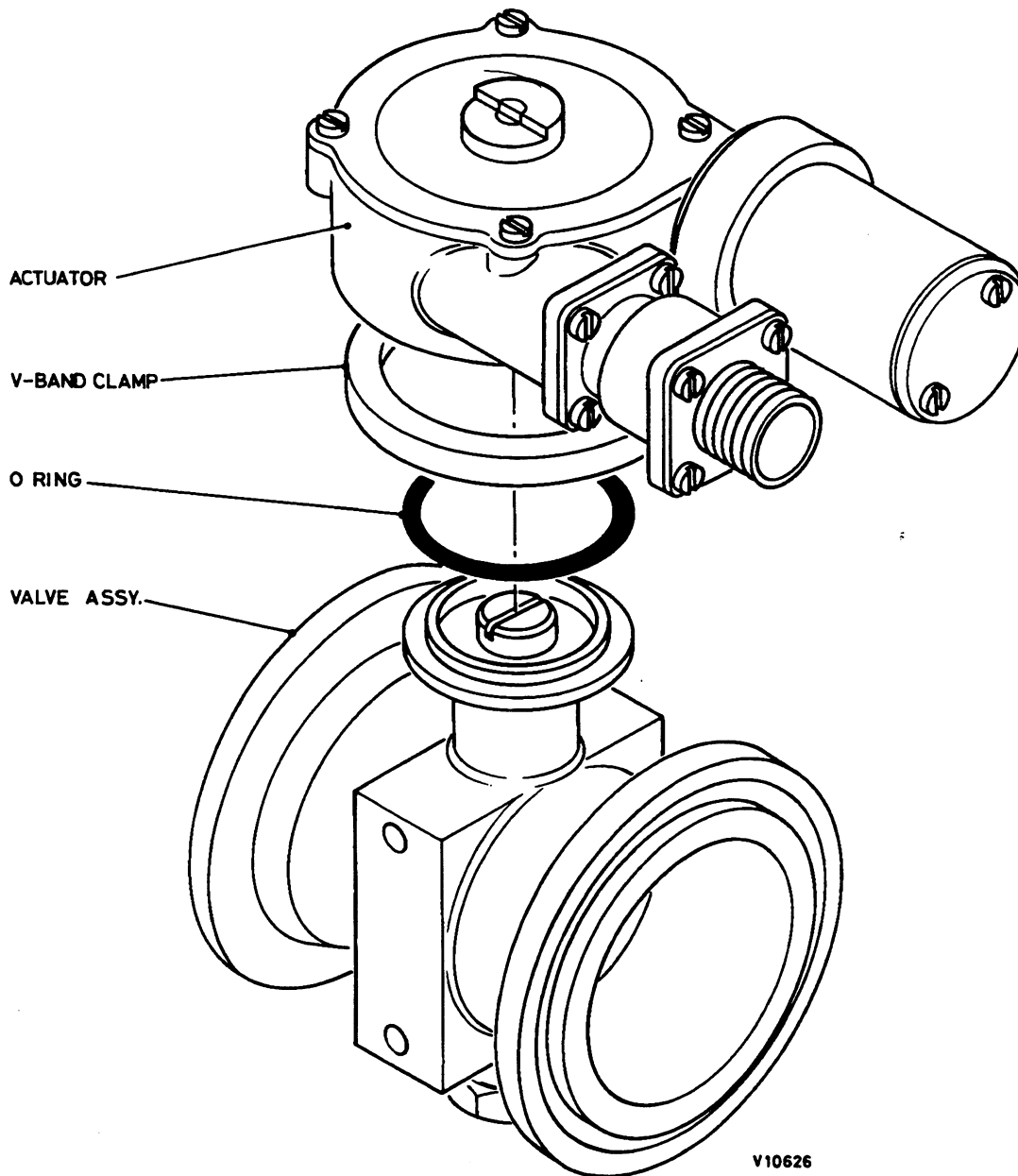
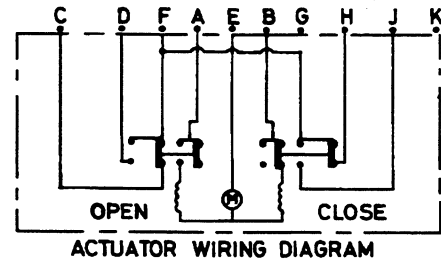
- (1) The valve is selected OPEN or CLOSED but does not reach the selected position after 50 seconds.
- (2) The valve is selected OPEN when the aircraft is on the ground.
- (3) The over-pressure switch has signalled the valve to close when it is selected OPEN.

A clutch acts to isolate the motor from the breaking effect as the actuator reaches its extreme positions. It also prevents damage to the actuator should the load on the output shaft exceed its preset value.

3. Data

Media	Air
Maximum operating temperature	600° F (315.6° C) at 55 psi
Maximum operating time between open and close limits	1 second at 28 v d.c. with a 5 lbf.in.loading
Maximum operating pressure	160 psi
Operating load	0.5 amps at 28 v d.c.

NOTE: *External leakage shall not exceed 0.1 lbs/min. at 55 psi and 45° F (7.2° C). Leakage across the valve shall not exceed 0.3 lbs/min. at 55 psi and 68° F (20° C).*



Main air valve (right-hand side)
Figure 1

EFFECTIVITY:

800XP

21-10-24

Page 2
July 95

MAIN AIR VALVE (RIGHT-HAND SIDE) - TROUBLE SHOOTING

Trouble	Probable cause	Remedy
Leakage at ducting connection	Connections loose or defective	Tighten connections or replace defective component
Erratic or sluggish operation	Electrical connection loose or defective	Tighten connection or replace defective component
	Butterfly binding	Replace unit
Unit operates in only one direction	Actuator defective	Replace unit
Unit inoperative	Electrical connection loose or defective	Tighten connection or defective component
	Actuator defective	Replace unit
	Butterfly seized in housing	Replace unit
Unit operates in both directions but incorrect indication signals	Actuator defective	Replace unit

EFFECTIVITY:

800XP

21-10-24

Page 101
July 95

MAIN AIR VALVE (RIGHT SIDE) - MAINTENANCE PRACTICES

1. Removal/Installation

A. Removal

- (1) At panel DA/D, open the MAIN AIR VLV 2 circuit breaker (Chapter 24, ELECTRICAL POWER).
- (2) Disconnect the electrical connector from the valve socket.
- (3) Release the clamps which secure the valve to the duct and bellows assembly. Remove the valve and seals.
- (4) Install blanks to the valve, duct and bellows assembly.

B. Installation

Equipment/Materials	Part/Item No.
Torque wrench capable of 40-50 lbf.in. (4.52-5.65 Nm)	Local supply

- (1) Remove the blanks from the valve, duct and bellows assembly.
 - (2) Position the valve so that the arrow on the valve body indicates the direction of airflow. Install serviceable seals and secure the valve to the duct and bellows assembly with the V-clamps. Torque-load V-clamp nuts to 40-50 lbf.in.(4.52-5.65 Nm).
- NOTE: It is permitted to rotate the valve about its axis to clear pipe runs.*
- (3) Connect the electrical connector to the valve.
 - (4) At panel DA/D close the MAIN AIR VLV 2 circuit breaker (Chapter 24, ELECTRICAL POWER).

2. Functional test

A. Procedure

- (1) Start No.2 engine and set throttle to ground idle (Chapter 71, POWER PLANT).

CAUTION: DUE TO THE DANGER OF OVERHEATING, VALVE OPERATION MUST BE LIMITED TO A MAXIMUM DURATION OF ONE MINUTE FOLLOWED BY A REST PERIOD OF FOUR MINUTES.

- (2) Operate the MAIN AIR VLV 2 switch to OPEN and make sure, that after a delay of 30 seconds, the valve motors to the fully open position within 1 second (nominal) and the MAIN AIR VALVE 2 annunciator on the MWS panel comes on.

WARNING: AIR LEAKS FROM JOINTS IN THE DUCTING WILL BE AT A HIGH TEMPERATURE. BE CAREFUL WHEN YOU EXAMINE JOINTS FOR LEAKS BY HAND.

- (3) Do a check on the valve joints, by touch, for leaks.

Raytheon Aircraft

HAWKER 800 AIRCRAFT MAINTENANCE MANUAL

- (4) Operate the MAIN AIR VLV 2 switch to CLOSE, and make sure that the valve moves to the fully closed position in 1 second (nominal) and the MAIN AIR VALVE 2 annunciator goes OFF.
- (5) Shut down the engine (Chapter 71, POWER PLANT).

B. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

MAIN AIR VALVE (LEFT-HAND SIDE) - DESCRIPTION AND OPERATION

1. Description *(Figure 1)*

The left-hand main air valve is an electric shut-off butterfly valve which has an electro-mechanical rotary actuator, heat shield, and a valve housing enclosing a butterfly assembly.

The actuator consists of a radio noise-free motor, friction brake, limit switches, gear train, linkage, and output shaft. The gear shaft supports a cam which actuates the limit switches. A pointer attached to the output shaft, in conjunction with a plate mounted on the heat shield, indicates the position of the butterfly. A receptacle is provided for the electrical system connection.

The heat shield, located between the actuator and the shut-off valve assembly reflects heat radiated from the air ducts and valve housing, thereby protecting the electrical motor and wiring.

The valve housing serves as an air duct and is flanged at each end for installation into a pneumatic system. An arrow cast as part of the housing indicates direction of airflow.

The butterfly assembly is within the valve housing. It consists of a butterfly mounted between two plates attached to a shaft. The shaft engages the output shaft of the actuator at one end and is supported on a ball bearing at the other. Position of the butterfly assembly within the duct is controlled by adjustment of a screw beneath the ball bearing.

2. Operation

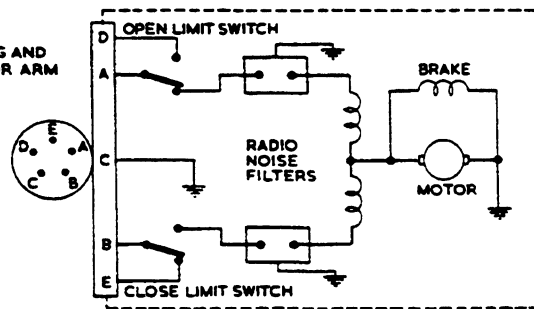
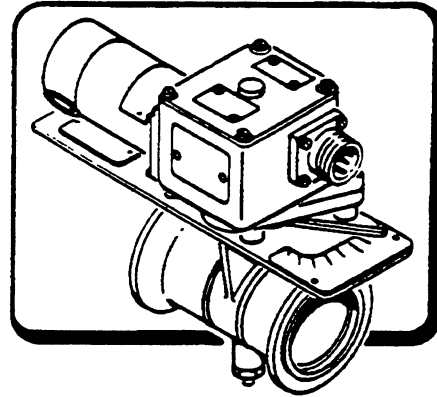
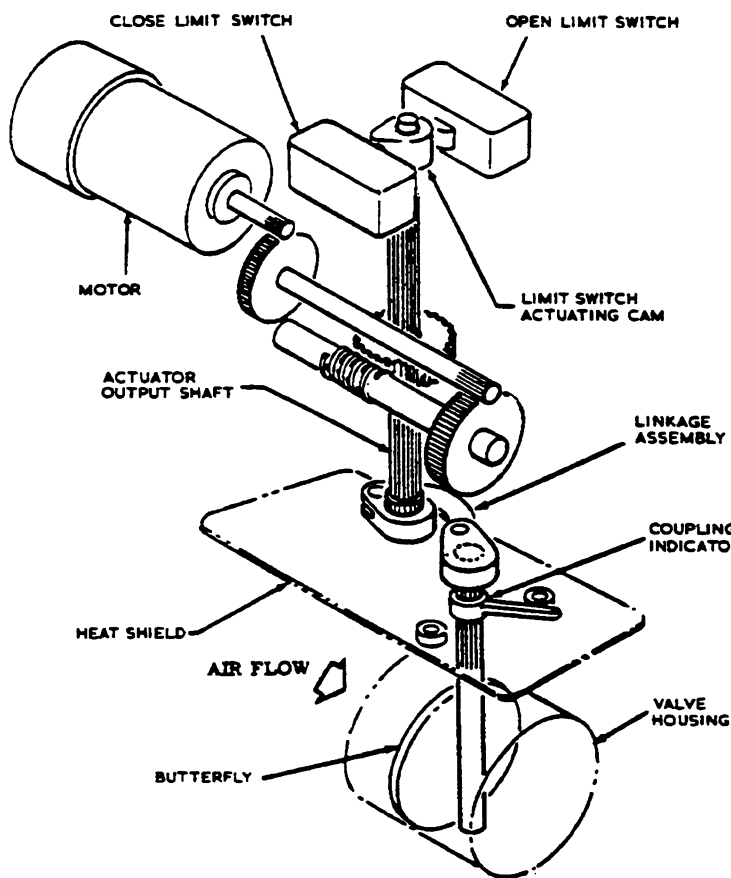
When the motor is energized, the output shaft of the motor drives the gear train to rotate the actuator output shaft. The rotary motion of the actuator output shaft is transmitted through the linkage assembly to the coupled butterfly shaft. The linkage assembly provides a regulated movement of the butterfly in relation to actuator output shaft rotation. Butterfly movement continues until the limit switch actuating cam operates the appropriate limit switch, thereby de-energizing the motor circuit.

With power applied through receptacle pins 'A' and 'C', the motor drives the gear train to rotate the butterfly toward the open position. The limit switch actuating cam operates the open limit switch to de-energize the motor circuit when the butterfly is fully open. With power applied through receptacle pins 'B' and 'C', the butterfly is rotated toward the closed position, and the close limit switch is actuated to de-energize the motor circuit when the butterfly is fully closed.

In addition to full actuation in either direction, the butterfly can be modulated, on demand, to any position between fully open and fully closed. The gear train and the magnetic friction brake hold the butterfly at any selected position until the motor is energized.

3. Data

Duty Cycle	1 min. on, 4 min. off
Operating time	10 to 14 sec.
Actuator	
Connections	
Pin A	Open
Pin B	Close
Pin C	Earth
Pin D	Energized when valve is full open
Pin E	Energized when valve is full closed
Operating voltage	26 ± 2 volts d.c.
Rated load current	1.0 AMP (MAX) at 26 volts d.c.



Main air valve (left-hand side)
Figure 1

M1634

EFFECTIVITY:

800XP

21-10-25

Page 2

July 95

MAIN AIR VALVE (LEFT-HAND SIDE) - TROUBLE SHOOTING

Fault	Probable cause	Remedy
Leakage at ducting connection	Connections loose or defective	Tighten connection or replace defective component
Erratic or sluggish operation	Electrical connection loose or defective	Tighten connection or replace defective component
	Butterfly binding	Replace unit
Unit operates in only one direction	Actuator defective	Replace unit
Unit inoperative	Electrical connection loose or defective	Tighten connection or defective component
	Actuator defective	Replace unit
	Butterfly seized in housing	Replace unit
Unit operates in both directions but incorrect indication signals	Actuator defective	Replace unit

MAIN AIR VALVE (LEFT SIDE) - MAINTENANCE PRACTICES

1. Removal/Installation

A. Removal

- (1) At panel DA/D, open the MAIN AIR VLV 1 circuit breaker (Chapter 24, ELECTRICAL POWER).
- (2) Disconnect the electrical connector from the valve socket.
- (3) Release the clamps which secure the valve to duct and bellows assembly. Remove valve and seals.
- (4) Install blanks to the valve, duct and bellows assembly.

B. Installation

Equipment/Material	Part/Item No.
Torque wrench capable of 40-50 lbf.in. (4.52-5.65 Nm)	Local supply

- (1) Remove the blanks from the valve, duct and bellows assembly.
 - (2) Position valve so that the arrow on the valve body indicates direction of airflow. Install serviceable seals and secure the valve to the duct and bellows assembly with the V-clamps. Torque-load V-clamp nuts to 40-50 lbf.in. (4.52-5.65 Nm).
- NOTE: It is permitted to rotate the valve about its axis to clear pipe runs.*
- (3) Connect the electrical connector to the valve.
 - (4) At panel DA/D, close the MAIN AIR VLV 1 circuit breaker (Chapter 24, ELECTRICAL POWER).

2. Functional test

A. Procedure

- (1) Start No.1 engine and set the throttle to ground idle (Chapter 71, POWER PLANT).

CAUTION: DUE TO THE DANGER OF OVERHEATING, VALVE OPERATION MUST BE LIMITED TO A MAXIMUM DURATION OF ONE MINUTE FOLLOWED BY A REST PERIOD OF FOUR MINUTES.

- (2) Operate the MAIN AIR VLV 1 switch to OPEN and make sure that the valve motors for 3.6 to 4.4 seconds, pauses for 5.4 to 6.6 seconds, motors for 1.8 to 2.2 seconds, pauses for 5.4 for 6.6 seconds, then motors to its fully open position within a further 2 seconds.
- (3) Make sure the MAIN AIR VLV 1 annunciator on the MWS panel comes on.

WARNING: AIR LEAKS FROM JOINTS INTO EH DUCTING WILL BE AT A HIGH TEMPERATURE. BE CAREFUL WHEN YOU EXAMINE JOINTS FOR LEAKS BY HAND.

Raytheon Aircraft

HAWKER 800 AIRCRAFT MAINTENANCE MANUAL

- (4) Do a check of the valve joints, by touch, for leaks.
- (5) Operate the MAIN AIR VLV 1 switch to CLOSE, and make sure the valve motors to the fully closed position in 10 to 14 seconds
- (6) Make sure the MAIN AIR VLV 1 annunciator on the MWS panel goes OFF.
- (7) Shut down the engine (Chapter 71, POWER PLANT).

B. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION AIR VALVE (HP) DESCRIPTION AND OPERATION

1. DESCRIPTION

The high pressure air valve has no attachment points. It is installed directly in the airplane high pressure ducting into the mixer valve. The valve contains a spring loaded piston which moves on a hollow shaft to open or close the inlet. The operation of the valve is controlled by a solenoid and a servo valve. These are both part of the valve assembly (Ref. Figure 1).

The solenoid circuit includes two diodes. One diode, in the positive line, provides protection against reverse polarity. The other diode is fitted across the solenoid to prevent voltage spike (Ref. Figure 3).

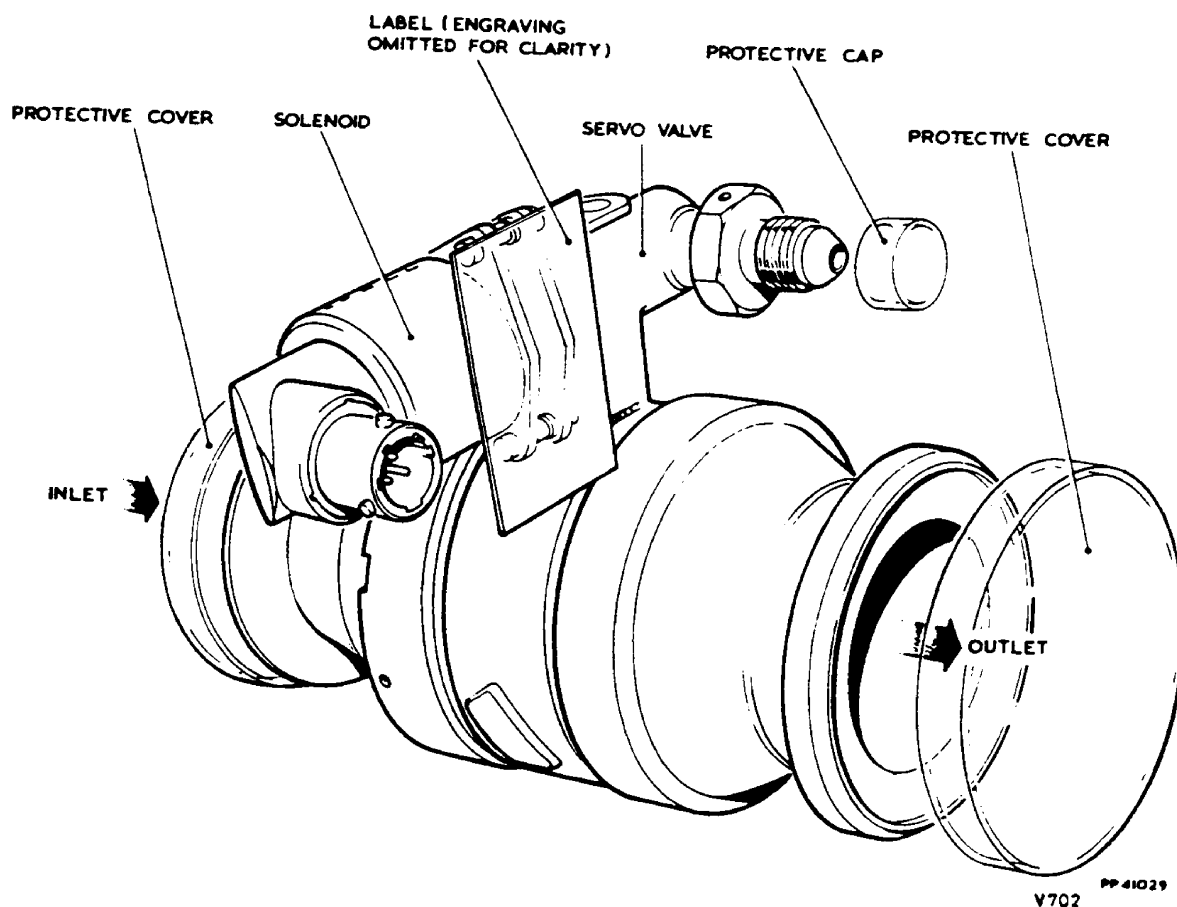


Figure 1
Air Valve (HP)

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

2. OPERATION

With no pressure in the ducting upstream of the air valve, the shut-off valve stays closed by the spring inside the piston (Ref. Figure 2).

With pressure upstream of the valve, when the solenoid is energized, the servo valve is held open against the spring. The action opens the vent to ambient from the piston chamber and the upstream pressure supply is shut off from the piston chamber. With upstream pressure acting on the upstream side of the piston and ambient pressure on the downstream side of the piston, the valve is held open against its spring.

When the solenoid is de-energized, the servo valve is moved to its other position by the spring, and closes the vent to ambient from the piston chamber. The servo valve movement also allows upstream air pressure to pass down the center shaft and through the servo valve to the piston chamber. The shut-off valve seat is smaller in diameter than the overall diameter of the piston, consequently air pressure in the piston chamber reacts on a larger area than that of the valve seat. Pressure differential therefore, assisted by spring force, closes the shut-off valve.

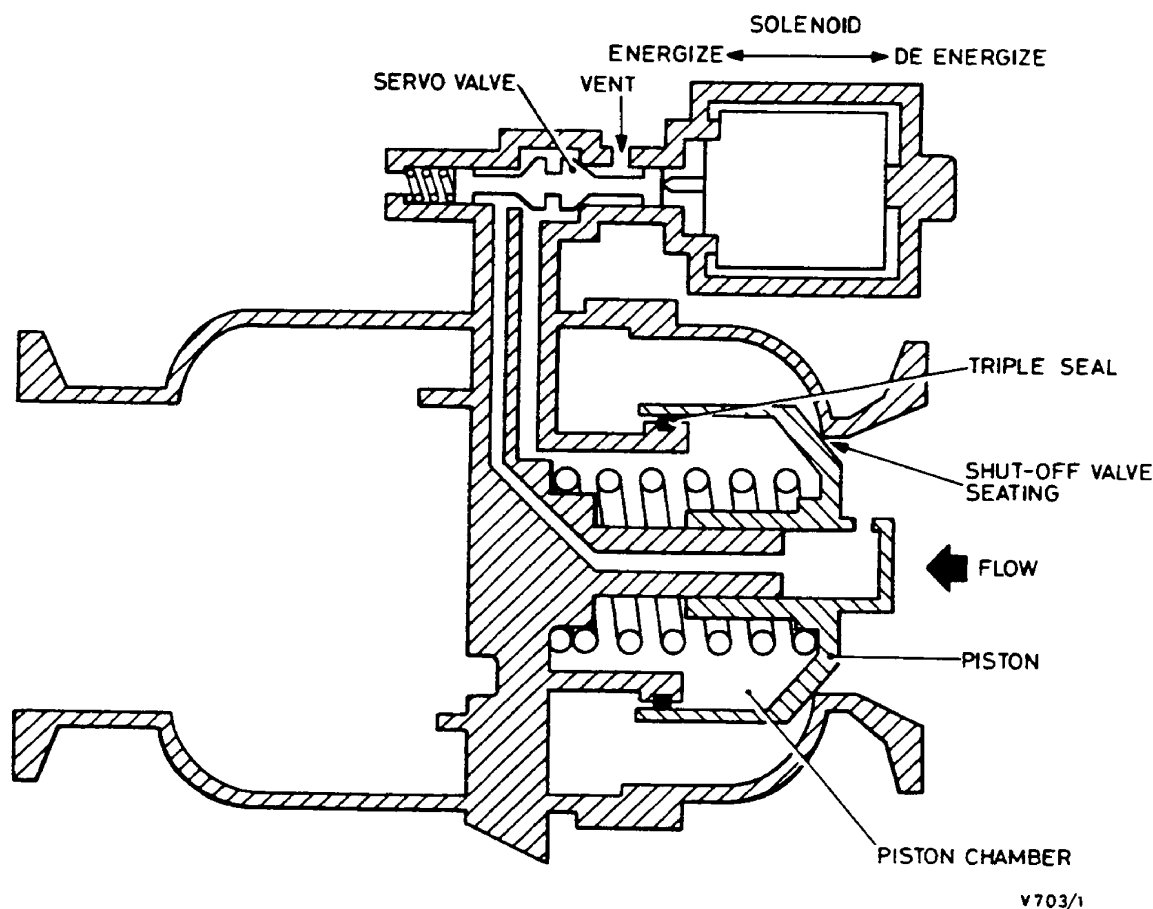


Figure 2
Schematic Diagram

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

3. DATA

HP air valve

Operating air flow (maximum)

20 lb/min (9.07 kg/min)

Operating air pressure (maximum) upstream

280 psig (19.31 bar)

Operating voltage

28 Vd.c. at 0.19 ampere maximum

Weight

1.82 lb (0.83 kg)

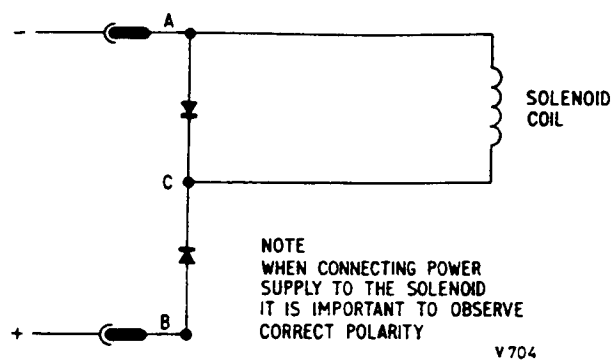


Figure 3
Solenoid Circuit Diagram

MIXING VALVE (LP/HP) - DESCRIPTION AND OPERATION

1. Description (Figure 1)

The bleed air mixing valve consists of a high stage pressure regulator, high stage valve body assembly, check valve, low stage valve body assembly, outlet valve body, and a reference regulator and temperature compensator.

The high stage pressure regulator consists of a spring-loaded closed poppet valve and diaphragm arrangement. The high stage pressure regulator compares regulated compressor high stage bleed pressure to ambient pressure.

The high stage valve body assembly provides a seat for the poppet valve and is bolted to the high stage pressure regulator and the low stage valve body assembly. A high pressure inlet test port is provided for customer use, and a filter is provided to prevent foreign particles from entering the internal passages.

The check valve consists of two flapper plates hinged on a single hinge pin in a check valve body. The flapper plates are torsion spring-loaded closed. The check valve allows air flow in one direction only.

The low stage valve body assembly houses the check valve, and is bolted to the outlet valve body and the high stage valve body assembly.

The reference regulator and temperature compensator consists of a reference regulator which may be actuated by the temperature compensator.

The reference regulator consists of a spring-loaded closed poppet valve arrangement. The reference regulator senses compressor high stage bleed pressure and ambient pressure.

The temperature compensator consists of bimetallic washers and an actuating piston which is spring-loaded away from the reference regulator poppet valve. The bimetallic washers change in spring tension with temperature changes.

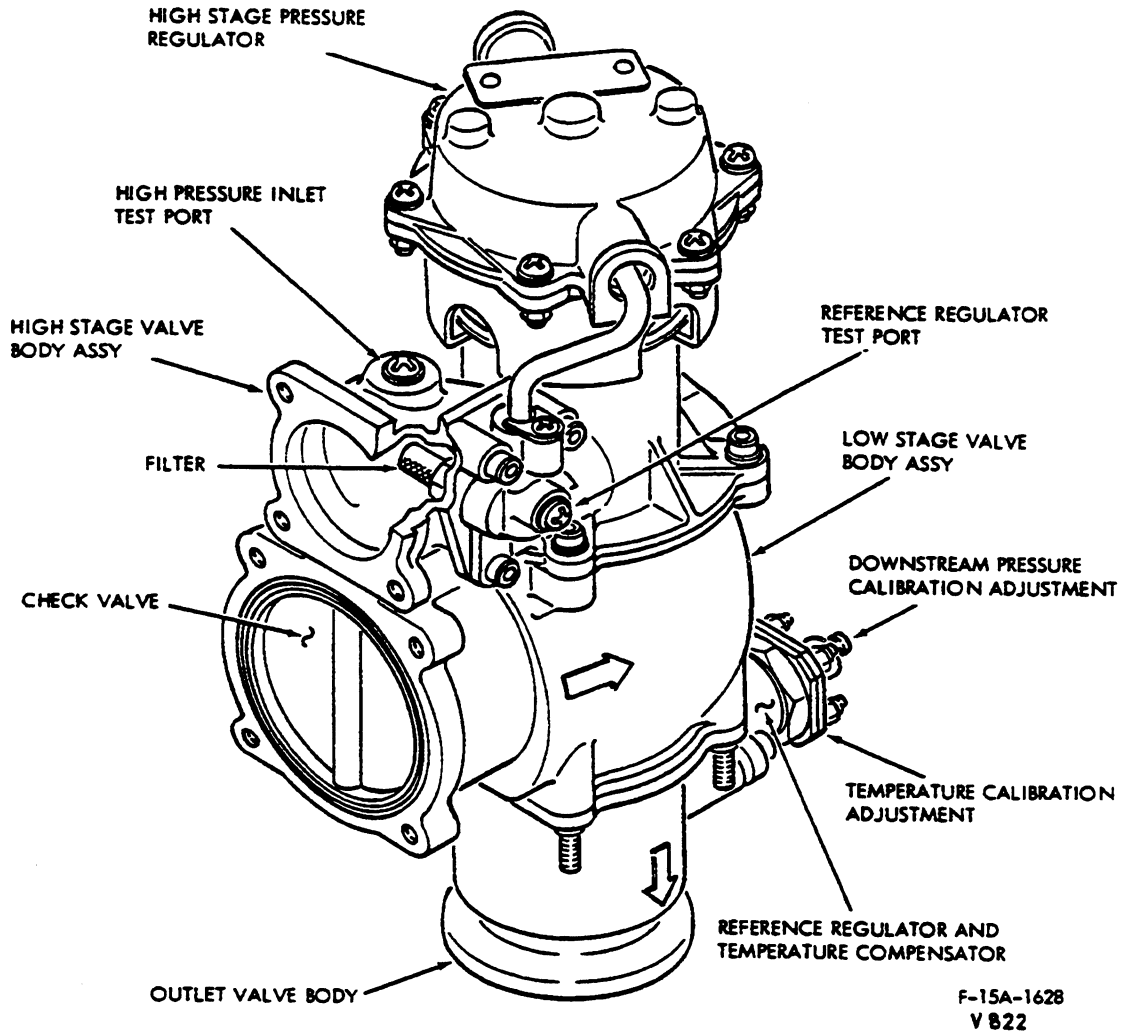
2. Operation (Figure 2)

NOTE: The bleed air mixing valve is shown with no compressor low stage or high stage bleed air applied.

When the compressor low stage bleed air pressure becomes sufficient to open the check valve, air is routed out through the outlet valve body.

Compressor high stage bleed air is routed through a filter to the reference regulator and the high stage pressure regulator. When the air pressure reaches a predetermined value, the reference regulator poppet valve will unseat, and vent compressor high stage bleed pressure to maintain a constant pressure in the high stage pressure regulator. The pressure in the high stage pressure regulator will unseat the poppet valve, and allow compressor high stage air to be mixed with the compressor low stage air at the outlet valve body.

Downstream pressure is sensed on the poppet valve and acts against the reference pressure in the pressure regulator to modulate the poppet position and maintain the desired downstream pressure. When the low stage pressure exceeds the desired minimum, the poppet valve will be fully closed.



Mixing valve - assembled view
Figure 1

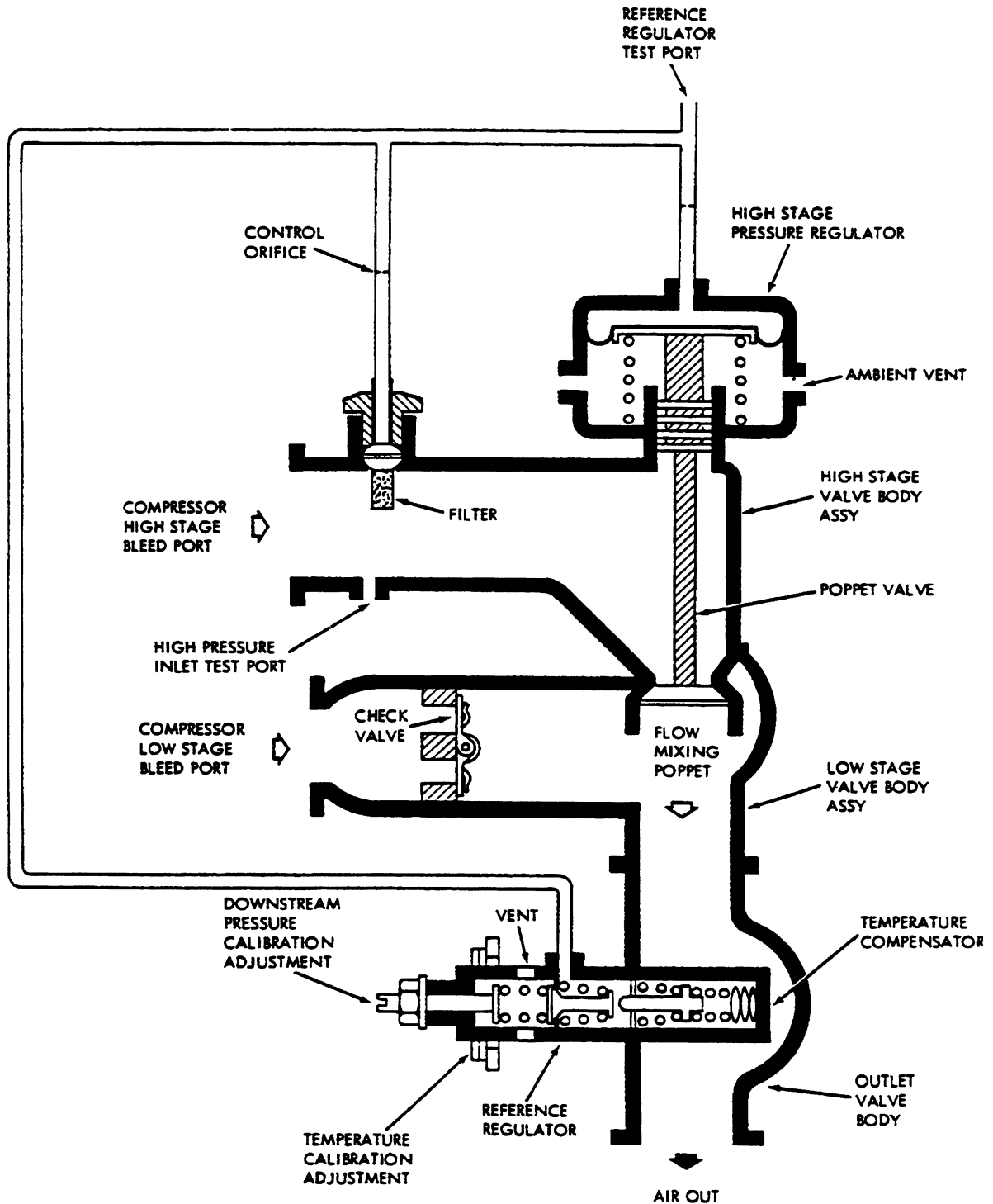
EFFECTIVITY:

800XP

21-10-35

Page 2

July 95



S-15A-1674
V 823

Mixing valve - schematic view
Figure 2

EFFECTIVITY:

800XP

21-10-35

Page 3

July 95

When the outlet air temperature exceeds a predetermined value, the bimetallic washers of the temperature compensator will increase spring tension sufficiently to cause the actuating piston to open the poppet valve of the reference regulator in proportion to the overtemperature. This increases the bleed off of the compressor high stage reference regulator resulting in a decrease in the pressure in the high stage pressure regulator. Spring force closes the poppet valve in proportion to the overtemperature.

When air pressure is removed from the compressor high stage bleed port, spring force drives the poppet valve closed. When compressor low stage bleed pressure drops below the forces of the torsion springs of the check valve, the check valve closes, to prevent reverse airflow.

3. Data

Check valve operation

Maximum crack pressure	0.2 psi
Reverse port leakage	0.2 pound per minute maximum at 50 psig and 27°C (80°F).

High stage pressure regulator

Minimum opening pressure	14 psi
Flow range	20 pounds per minute
Outlet pressure with high stage open	18 to 22 psi
Temperature compensation mode operation	Normally 200°C

Weight	6 lb. max.
--------	------------

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION MIXING VALVE (LP/HP) REMOVAL/INSTALLATION

1. INFORMATION

If a mixing valve is replaced after a detected failure, the components that follow must also be inspected for damage, distortion and blockage caused by system overpressure. These components must be inspected before an engine run is done:

- The main air valve.
- The non-return valves (left and right).
- The pressure regulator and shut-off valve.
- The flow control venturi and sense pipes.
- The heat exchanger.

Equipment/Materials	Part/Item No.
Torque wrench 35 to 50 lb. in (3.95 to 5.65 Nm)	Local Supply
Cleaner, Solvent	201 (Ref. AMM 125/H-20, 20-95-201)
Compound, Sealing	366 (Ref. AMM 125/H-20, 20-95-301)
Cloth, Lint Free	621 (Ref. AMM 125/H-20, 20-95-601)
Wire, corrosion resistant	651 (Ref. AMM 125/H-20, 20-95-601)

2. REMOVAL/INSTALLATION

A. Removal

	MECH	INSP
(1) Open access door to rear equipment bay.		
(2) Remove clamp securing air bleed duct to mixing valve (Ref. Figure 401).		
(3) Disconnect rudder bias pipeline from adapter on firewall pan.		
(4) Release fasteners and remove access panel in pylon fillet.		
(5) Remove clamps from LP and HP ducts.		
(6) Position operator inside fuselage to support mixing valve.		
(7) Remove 13 bolts securing firewall pan to rib.		
(8) Remove mixing valve assembly.		
(9) Remove heat shields.		
(10) Remove rudder bias pipe adapter from LP duct.		

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(11) Remove bolts that secure LP and HP ducts; discard O-rings, Lo-load seals and tab washers; remove mixing valve.		

B. Pre-installation Preparation

	MECH	INSP
(1) Install firewall pan with LP and HP ducts to new mixing valve. Use new O-rings at LP duct, and new Lo-load seals at HP duct on each side of seal plate. Install bolts with new tab washers. Tighten bolts evenly and lock with tab washers.		
(2) Install adapter into LP duct with new O-ring, and install seal and back plate with 2 bolts. Lock the adapter to the drilled bolt head with wire (Item 651).		
(3) Install rear heat shield on the applicable lugs.		
(4) Then install forward shield, where necessary put washers on the studs below the forward heat shield to make it level. Secure with stiffnuts.		
(5) Clean the mating face of the firewall pan and rib with a lint free cloth (Item 621) and cleaning solvent (Item 201).		
(6) Apply sealing compound (Item 366) to the mating face of the firewall pan.		

C. Installation

	MECH	INSP
(1) Position mixing valve assembly and secure with 13 bolts.		
(2) Install clamp, with new seals, to LP duct. Torque load clamp from 35 to 45 lb.in. (3.95 to 5.08 Nm).		
(3) Install clamp, with new seal, to HP duct. Torque load clamp from 35 to 40 lb.in. (3.95 to 4.52 Nm).		
(4) Install clamp, with new seal, to valve outlet and air bleed duct. Torque load clamp from 40 to 50 lb.in. (4.52 to 5.65 Nm).		
(5) Connect rudder bias pipeline to adapter and lock with wire (Item 651).		
(6) Do a functional test of the mixing valve (Ref. 21-10-35, 501).		
(7) Do a functional test of the rudder bias system (Ref. 27-20-00, 501).		

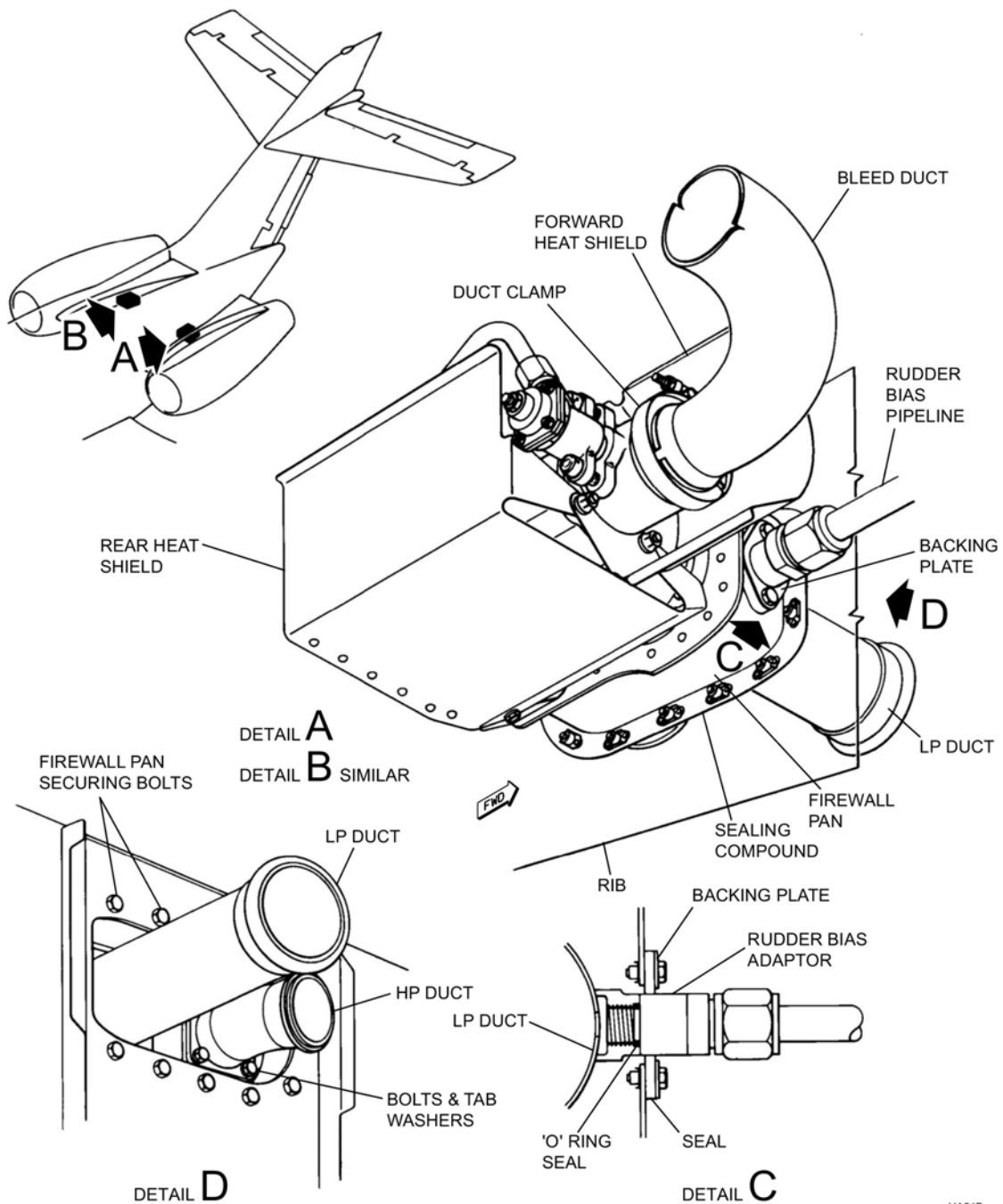
D. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

E51627



HA21B
029155AA.PDF

Figure 401
Mixing Valve Installation

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION MIXING VALVE (LP/HP) ADJUSTMENT/TEST

1. INFORMATION

Equipment/Materials	Part/Item No.
Pressure Gauge 0 to 60 psi (0 to 4.14 bar)	Local Supply
30 feet (9.14 m) of high pressure 1/4 in. (6.35 mm) I/D hose.	Local Supply
Jet pump bulkhead adapter.	Local Supply

WARNING: Air leaks from joints in the ducting will be at a high temperature. Be careful when you examine joints for leaks by hand.

2. LEAK TEST

A. Procedure

- (1) Open the ventral tank access panel and the rear equipment bay door.
- (2) Run the relevant engine at idle rpm (Ref. 71-00-00, 501).
- (3) Select relevant main air valve to OPEN, and do a check of all disturbed joints for leaks.
- (4) Select main air valve to CLOSE.
- (5) Stop the engine (Ref. 71-00-00, 501).
- (6) Close and secure the rear equipment bay door and the ventral tank access panel.

3. FUNCTIONAL TEST

A. Preparation

- (1) Remove the furnishings/equipment necessary to get access to the cabin side of the rear pressure bulkhead.
- (2) At the rear pressure bulkhead, cabin side, disconnect the engine jet pump pressure pipe from the bulkhead adapter.
- (3) Install a blank to the disconnected pipe.
- (4) Connect the 30 ft. (9.14 m) long hose to the bulkhead adapter using an appropriate adapter.
- (5) Install the pressure gauge to the other end of the hose to provide cockpit indication.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

B. Procedure

NOTE: The procedure is written for a functional test of the left mixing valve. The test may be run for the right mixing valve by similarity to the left mixing valve procedure.

- (1) Select both left and right main air valves to CLOSE. Check that the MWS annunciator is not lit.
- (2) Remove the electrical plug coded GY from the left main air valve (No. 1 main air valve annunciator will come ON).

NOTE: When performing step (2) on the R/H side the No.2 main air valve annunciator will not come ON.

- (3) Start engine No.1 and run at ground idle speed (Ref. 71-00-00, 501). The pressure gauge should read less than 5 psi (0.34 bar). Record the pressure indication. If the pressure gauge reads higher than 5 psi (0.34 bar), the HP valve may be stuck open or leaking excessively.
- (4) Select the left main air valve to LP ON. The pressure gauge reading should not increase.
- (5) Select the left main air valve to OPEN. The pressure gauge reading should increase. If the pressure does not increase, the HP valve may be staying closed or the mixing valve may be malfunctioning.
- (6) Select the left main air valve to CLOSED. The pressure gauge reading should return to the value recorded in step (3). If the pressure gauge reading does not return to the initial value, the HP valve is not closing.

Mixing Valve Reference Regulator and Thermal Compensator Test.

- (7) Select the left main air valve OPEN.
- (8) Run the engine at $40 \pm 0.5\% N_1$ for 1 minute.
- (9) Record the pressure (P_1).
- (10) Increase the engine power to $57 \pm 0.5\% N_1$ for 3 minutes.
- (11) Reduce the engine to $40 \pm 0.5\% N_1$ for 1 minute.

NOTE: If $\%N_1$ drops below $40 \pm 0.5\%$ do not advance the throttle to take the reading. Return to $57 \pm 0.5\% N_1$ and attempt to obtain step (11) again.

- (12) Record the pressure (P_2).
- (13) Acceptance Criteria: P_1 and P_2 must be greater than 17 psi.
- (14) Stop No.1 engine (Ref. 71-00-00, 501).
- (15) Reconnect the electrical plug GY to left main air valve.
- (16) Dissipate pressure and remove the pressure gauge, hose and adapter.
- (17) Reconnect the engine jet pump pressure pipe to the bulkhead.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

4. CLOSE UP

A. Procedure

- (1) At the rear pressure bulkhead, disconnect the 30 ft. long hose from the adapter.
- (2) Remove the hose and pressure gauge from the airplane.
- (3) Remove the adapter from the bulkhead union and the blank from the disconnected pipe.
- (4) Reconnect the engine jet pump pressure pipe to the bulkhead union.
- (5) Do a leak test of the disturbed pipeline (Ref. paragraph 2.A. (2) thru (5)).
- (6) Make sure the work area is clean and clear of tools and other equipment.

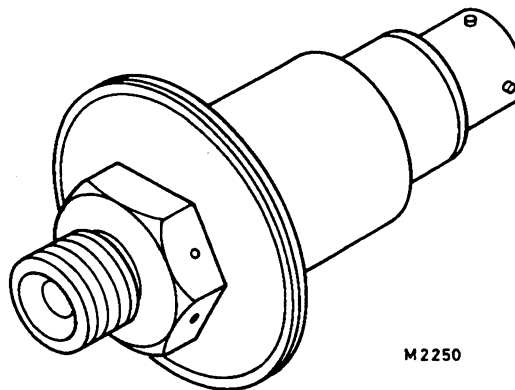
LP PRESSURE SWITCH - DESCRIPTION AND OPERATION

1. Description

The LP pressure switch is a pneumatically actuated differential pressure switch. It has one set of electrical contacts which give an electrical signal when the contacts close at the set pressure. The switch will close its contacts on a falling pressure of 27 ± 2 psi and open its contacts at 30 psi on a rising pressure. The left and right switches are installed in the rear equipment bay and each is connected to a T-piece in the rudder bias pipe in the LP bleed air duct, upstream of the mixer valve, in each pylon.

2. Operation

The switch senses the pressure of the hot LP bleed air in the pylon between the engine and the mixing valve. When the pressure of the LP bleed air falls below 27 ± 2 psi, the switch signals the HP air valve to supply additional air to the system. When the switch senses a pressure of 30 psi, it will signal the HP air valve to supply less or no air to the system.



LP pressure switch
Figure 1

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION LP PRESSURE SWITCH MAINTENANCE PRACTICES

1. INFORMATION

Equipment/Materials	Part/Item No.
Wire, corrosion resistant	651 (Ref. AMM 125/H-20, 20-95-11)
Pressure Gauge 0 to 60 psi (0 to 4.14 bar)	Local Supply
30 feet (9.14 m) of high pressure 1/4 in. (6.35 m) I/D hose	Local Supply
Jet pump bulkhead adapter	Local Supply
30 volt D.C. Multimeter	Local Supply

WARNING: Air leaks from joints in the ducting will be at a high temperature. Be careful when you examine joints for leaks by hand.

2. REMOVAL/INSTALLATION

A. Removal

	MECH	INSP
(1) On panel DA/D, open, safety and tag the related MAIN AIR VLV 1 or MAIN AIR VLV 2 circuit breaker.		
(2) Put a warning notice in the flight compartment to prohibit the use of the air conditioning system.		
(3) Open the rear equipment bay door.		
(4) Disconnect the electrical connector from the LP switch. Install a protective cap to the electrical connector.		
(5) Disconnect the pressure sensing pipe from the switch.		
(6) Remove the nut and bolt that holds the P-clip around the switch body.		
(7) Remove the switch and blank off the open air port and the electrical connector.		
(8) Blank off the open port on the sensing pipe.		

B. Installation

	MECH	INSP
(1) Remove the protective caps from the switch and the sensing pipe.		

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(2) Install the P-clip around the switch body. Attach the pressure switch to the bracket assembly and tighten the nut and bolt.		
(3) Connect and safety the pipe to the switch with the lockwire (Item 651).		
(4) Connect the electrical connector to the switch.		
(5) Close the circuit breaker opened in paragraph 2.A.(1).		
(6) Remove the warning notice installed in the flight compartment at paragraph 2.A.(2).		

3. FUNCTIONAL TEST

A. Preparation

- (1) Remove the furnishings/equipment necessary to get access to the cabin side of the rear pressure bulkhead.
- (2) At the rear pressure bulkhead, cabin side, disconnect the engine jet pump pressure pipe from the bulkhead adapter.
- (3) Install a blank to the disconnected pipe.
- (4) Connect the 30 ft (9.14 m) long hose to the bulkhead adapter using an appropriate adapter.
- (5) Install the pressure gauge to the other end of the hose to provide cockpit indication.

B. LH Pressure Switch

- (1) Make sure that both right and left main air valves are selected to CLOSE.
- (2) Remove the electrical plug coded GY from the left main air valve (MAV).
- (3) Set the multimeter for resistance measurement and connect the positive probe of the multimeter to terminal D10R on the GG panel located on rear pressure bulkhead and the negative probe of the multimeter to a convenient airplane ground. The multimeter should read low resistance.
- (4) Start engine No. 1 (Ref. 71-00-00, 501).
- (5) Run the engine to maximum rpm, back to idle, then to maximum rpm and back to idle. Make sure that when the engine is at maximum rpm the pressure switch opens (the multimeter indicates an open circuit). Make sure that when the engine returns to idle the pressure switch closes (the multimeter should read low resistance).
- (6) Repeat step (5).
- (7) Increase the engine rpm slowly. Check that the pressure switch opens before the pressure gauge reading exceeds 31 psi (2.14 bar) (approximately 75% N₁ fan speed). The multimeter should indicate an open circuit.
- (8) Reduce the engine rpm slowly. Check that the pressure switch closes when the pressure gauge reading is between 24 and 30 psi (1.65 and 2.07 bar). The multimeter should read low resistance.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (9) Continue to reduce the engine rpm slowly to idle. Check that the pressure reading reduces to less than 5 psi (0.34 bar). The multimeter should read low resistance.
- (10) Disconnect the multimeter from the airplane and reconnect the electrical plug code GY to the left main air valve.
- (11) Select No.1 MAV to LP ON. Check that the MWS annunciator illuminates and airflow is available at both cockpit ventilation outlets.
- (12) Select No.1 MAV to OPEN. Confirm ITT rise and down surge, as shown on the triple indicator on the copilots instrument panel, (minimum 20°C (68°F) increase in ITT and 1000 ft (304.8 m) down surge).
- (13) Increase N₁ from idle to 50%. Check that N₂ shaft speed is between 76 and 80%. Record N₂ speed and jet pump indication. Check that the pressure gauge reads between 17 and 23 psi (1.17 and 1.59 bar).
- (14) Stop engine No. 1 (Ref. 71-00-00, 501).

C. RH Pressure Switch

- (1) Make sure that both right and left main air valves are selected to CLOSE.
- (2) Remove the electrical plug coded GZ from the right main air valve (MAV).
- (3) Set the multimeter for resistance measurement and connect the positive probe of the multimeter to terminal G10R on the GG panel located on rear pressure bulkhead and the negative probe of the multimeter to a convenient airplane ground. The multimeter should read low resistance.
- (4) Start engine No. 2 (Ref. 71-00-00, 501).
- (5) Run the engine to maximum rpm, back to idle, then to maximum rpm and back to idle. Make sure that when the engine is at maximum rpm the pressure switch opens (the multimeter indicates an open circuit). Make sure that when the engine returns to idle the pressure switch closes (the multimeter should read low resistance).
- (6) Repeat step (5).
- (7) Increase the engine rpm slowly. Check that the pressure switch opens before the pressure gauge reading exceeds 31 psi (2.14 bar) (approximately 75% N₁ fan speed). The multimeter should indicate an open circuit.
- (8) Reduce the engine rpm slowly. Check that the pressure switch closes when the pressure gauge reading is between 24 and 30 psi (1.65 and 2.07 bar). The multimeter should read low resistance.
- (9) Continue to reduce the engine rpm slowly to idle. Check that the pressure reading reduces to less than 5 psi (0.34 bar). The multimeter should read low resistance.
- (10) Disconnect the multimeter from the airplane and reconnect the electrical plug code GZ to the right main air valve.
- (11) Select No.2 MAV to LP ON. Check that the MWS annunciator illuminates and airflow is available at both cockpit ventilation outlets.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (12) Select No.2 MAV to OPEN. Confirm ITT rise and down surge, as shown on the triple indicator on the copilots instrument panel, (minimum 20°C (68°F) increase in ITT and 1000 ft (304.8 m) down surge).
- (13) Increase N₁ from idle to 50%. Check that N₂ shaft speed is between 76 and 80%. Record N₂ speed and jet pump indication. Check that the pressure gauge reads between 17 and 23 psi (1.17 and 1.59 bar).
- (14) Stop engine No. 2 (Ref. 71-00-00, 501).

4. CLOSE UP

A. Procedure

- (1) At the rear pressure bulkhead, disconnect the 30 ft. (9.14 m) long hose from the adapter.
- (2) Remove the hose and pressure gauge from the airplane.
- (3) Remove the adapter from the bulkhead adapter and the blank from the disconnected pipe.
- (4) Connect the engine jet pump pressure pipe to the bulkhead adapter.
- (5) Do a leak test of the disturbed pipeline (Ref. 21-10-35, 501).
- (6) Install any and all furnishings/equipment removed in paragraph 3.A. (1).
- (7) Make sure the work area is clean and clear of tools and other equipment.

PRESSURE REGULATOR AND SHUT-OFF VALVE (PRSOV) - DESCRIPTION AND OPERATION

1. General

The pressure regulator and shut-off valve (PRSOV) is installed in the supply system to maintain a constant downstream regulated pressure relative to ambient pressure. The PRSOV is installed in the rear equipment bay below the engine beam. The body of the valve is enclosed in a thermal muff.

2. Description (*Figure 1 and Figure 2*)

The PRSOV is a pneumatically actuated valve with a butterfly closure element that is spring loaded to the closed position. An electrically operated solenoid valve is provided to select the PRSOV to the open/control or closed position.

The schematic (*Figure 2*) is shown with the solenoid valve de-energized and no pressure supplied. Whenever the minimum operating pressure is exceeded, the valve opens and the pressure is regulated. Loss of electrical power results in the PRSOV staying in the open position to maintain a regulated airflow. A visual position indicator is provided to indicate the position of the butterfly valve. The valve is closed by energizing the solenoid valve.

NOTE: The table in Figure 2 presents valve position as a function of inlet pressure and applied voltage at the solenoid.

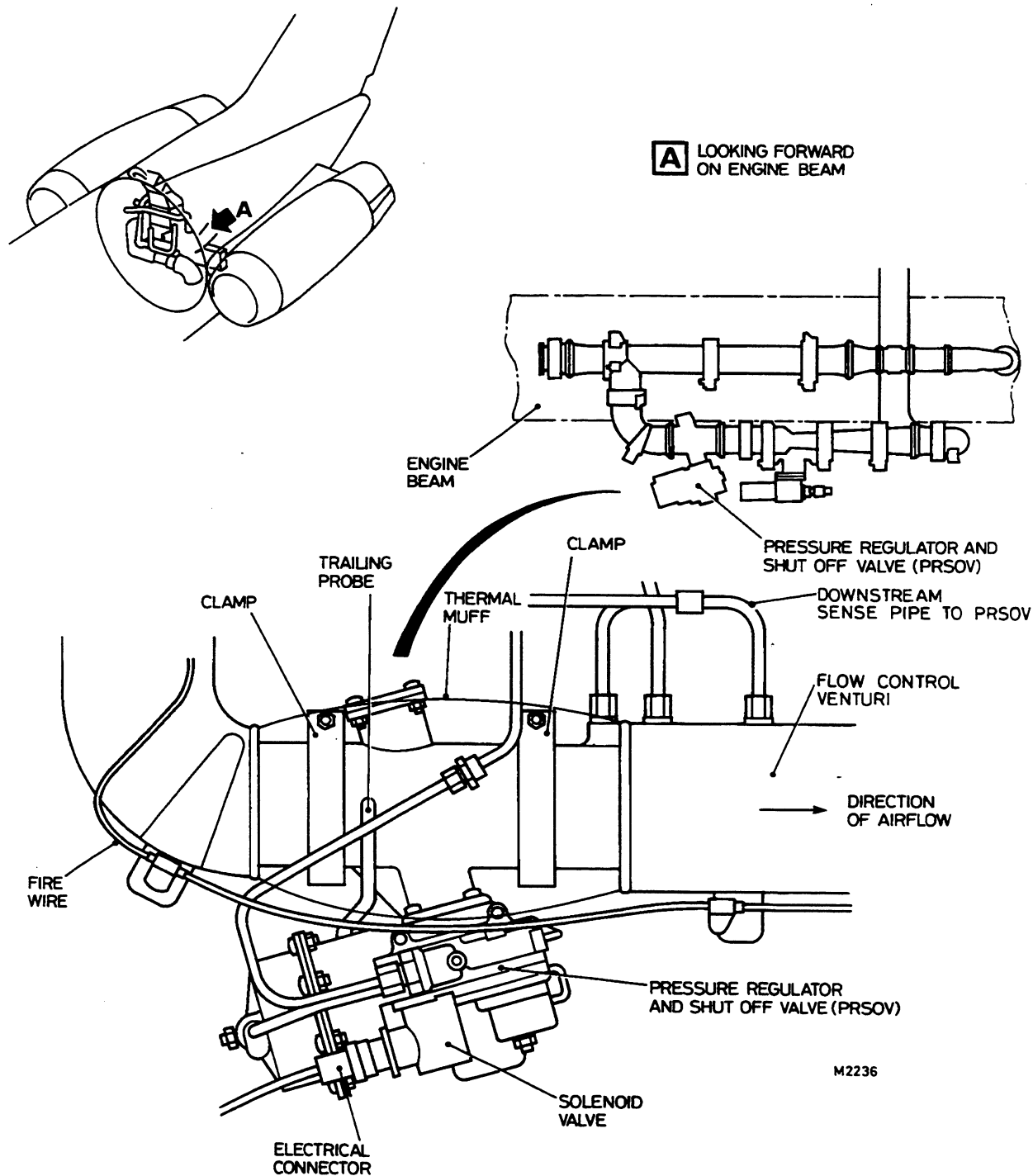
3. Operation

Inlet pressure is routed through the trailing probe, the reference regulator, and the solenoid valve, to the actuator opening chamber. The actuator opening diaphragm has a larger area than the actuator closing piston. Because of the resulting net opening area, an opening force results when the two actuator chambers are supplied with the same pressure. The valve moves to the open position when the inlet pressure rises to a level sufficient to compress the actuator closing spring. When the solenoid valve is energized to the opposite position, the supply pressure is blocked and the actuator opening chamber is vented to ambient through the solenoid valve. The actuator closing spring, in combination with the pressure in the closing chamber, closes the valve.

A. Pressure regulation (*Figure 2*)

When the pressure downstream of the reference regulator reaches the desired level, the force resulting from this pressure on the reference regulator diaphragm balances the calibration spring force. This causes the metering valve to move towards the seat and control the pressure to the desired level (reference pressure).

The downstream pressure increases until the force generated by the valve downstream pressure in the closing chamber, and the force of the actuator closing spring, balances the force generated by the reference pressure in the actuator opening chamber. The valve butterfly is then repositioned by the actuator. Position of the valve butterfly maintains the downstream pressure at the level required to sustain this actuator force balance, and also maintain the desired downstream pressure.



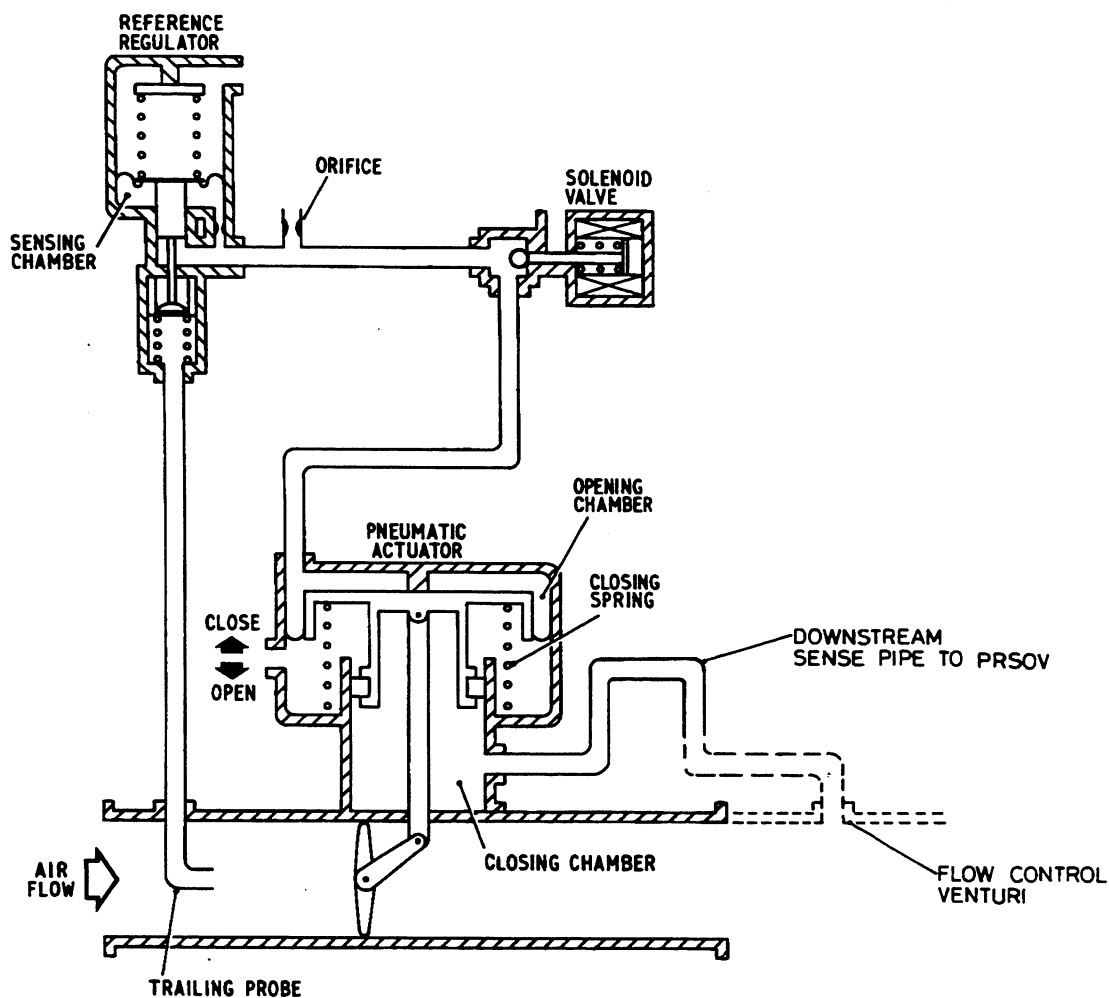
Pressure regulator and shut-off valve - location
Figure 1

EFFECTIVITY:

800XP

21-10-76

Page 2
July 95



OPEN/CLOSE POSITIONS OF PRESSURE REGULATOR AND SHUTOFF VALVE			
CONDITION	ELECTRICAL INPUT TO SOLENOID, vdc	PRESSURE AT VALVE INLET, psig	VALVE (BUTTERFLY) POSITION
1	0	0	FULL CLOSED
2	+28	0 TO 215	FULL CLOSED
3	0	0 TO 5	PARTIALLY OPEN
4	0	5 TO 27.5	FULL OPEN
5	0	27.5 TO 215	MODULATES TO 27.5 ± 2.5 psig

M14572/1

Pressure regulator and shut-off valve - schematic

Figure 2

EFFECTIVITY:

800XP

21-10-76

Page 3

July 95

PRESSURE REGULATOR AND SHUTOFF VALVE (PRSOV) - REMOVAL/INSTALLATION

1. Removal/Installation *(Figure 401)*

A. Removal

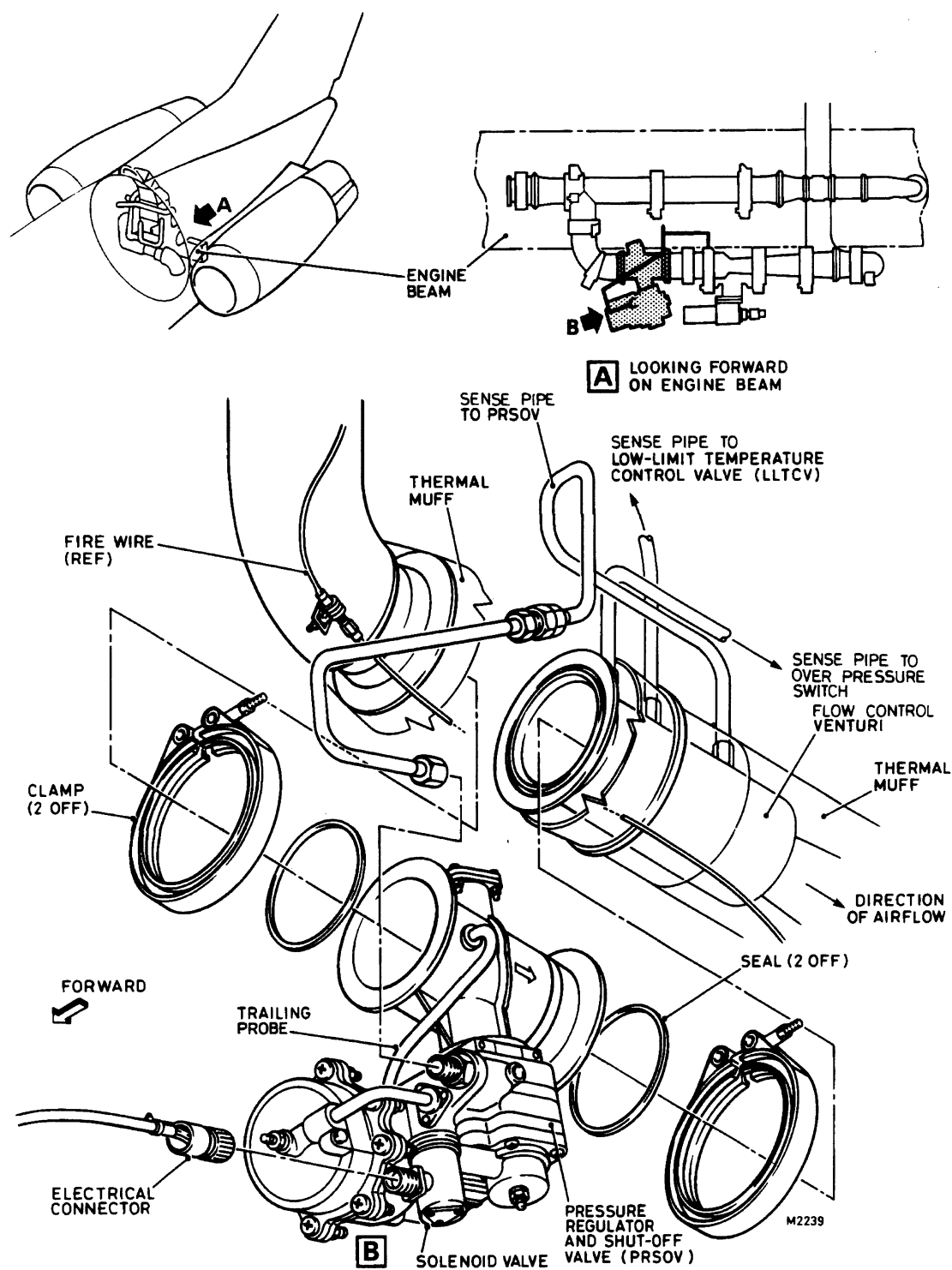
- (1) On panel DA/D, open, safety and tag circuit breaker MAIN AIR VLV 1 (Chapter 24, ELECTRICAL POWER).
- (2) Put a warning notice in the flight compartment to prohibit the use of the air conditioning system.
- (3) Open the rear equipment bay door. Unfasten the hose clips that attach the thermal muff. Remove the thermal muff.
- (4) Disconnect the airplane electrical connector from the solenoid valve connector. Install protective dust caps to both connectors.
- (5) Disconnect the downstream sensing pipe from the PRSOV.
- (6) Disconnect and remove the clamps that attach the PRSOV to the airplane system. Remove the PRSOV.
- (7) Remove the seals from the air conditioning ducting.
- (8) Install blanks to the valve and air conditioning ducting.

B. Installation

- (1) Remove blanking caps from air conditioning ducting and PRSOV.
- (2) Install serviceable seals to the PRSOV.
- (3) Install the PRSOV to the air conditioning ducting with the solenoid valve beneath ducting, facing forward.
- (4) Install the clamps to PRSOV and the air conditioning ducting; do not fully tighten at this stage.
- (5) Remove the dust caps from the electrical connectors. Install the airplane connector to PRSOV solenoid valve connector.
- (6) Connect the downstream sensing pipe to the PRSOV.
- (7) Torque tighten the clamps to between 35 and 40 lbf. in. (3.95 to 4.5 Nm).
- (8) On panel DA/D, remove safety tag and close the circuit breaker MAIN AIR VLV 1 (Chapter 24, ELECTRICAL POWER).
- (9) Do a functional test of the PRSOV (ADJUSTMENT/TEST).
- (10) Install the thermal muff removed in paragraph 1.A.(3).
- (11) Remove the warning notice from the flight compartment.

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



Pressure regulator and shut-off valve - installation

Figure 401

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

(12) Close the rear equipment bay door.

C. Close up

(1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION

PRESSURE REGULATOR AND SHUT-OFF VALVE (PRSOV) ADJUSTMENT/TEST

1. INFORMATION

Equipment/Materials	Part/Item No.
Pressure gauge, 0 to 60 psi (0 to 4.14 bar)	Local supply
Wedge	Local supply
Adapter 1 1/16 - 12UN-3A	Local supply

2. ADJUSTMENT/TEST

A. Functional Test

Action		Result
(1) Make sure that the airplane is ready for the engines to be ground run (Ref. 71-00-00, 501).	...	—
(2) Put a 0 to 60 psi (0 to 4.14 bar) pressure gauge in the flight compartment and connect it through a hose to the flow control venturi in the rear equipment bay. Connect the hose to the venturi as follows: • At the venturi, disconnect the pipe between the low-limit temperature control valve and the venturi (Ref. 21-10-76, 401 (Figure 401)). • Install the hose to the venturi using a 1 1/16 - 12UN-3A adapter.	...	—
(3) Start both the airplane engines and run at ground idle (Ref. 71-00-00, 501).	...	—
(4) Install a locally manufactured wedge to operate the Left MLG weight on wheels microswitch.	...	—
(5) On roof panel CG, set MAIN AIR VLV 1 and MAIN AIR VLV 2 switches to OPEN.	...	Main air valves 1 and 2 open.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

Action		Result
(6) On roof panel CG, set CABIN TEMP control to FULL MANUAL COLD. Do a check of the pressure gauge reading.	...	Pressure gauge indicates pressure for confirmation that the PRSOV is open.
(7) Slowly increase the speed of both engines and monitor the pressure gauge reading.	...	Pressure gauge reading increases as engine speed increases. Rate of rise in pressure reduces when 70% N ₁ has been reached.
(8) Continue to increase the speed of the engines until take-off power is reached.	...	Pressure gauge reading must stabilize at not more than 30 psi (2.07 bar).
(9) Reduce the engine speed to ground idle.	...	Make sure that the MAIN AIR VLV 2 annunciator on the MWS panel does not come 'ON'.
(10) Slam accelerate both engines from ground idle to take-off power.	...	—
(11) When engines have stabilized, slam decelerate both engines to ground idle.	...	Make sure the MAIN AIR VLV 2 annunciator on the MWS panel does not come 'ON'.
NOTE		
If the MAIN AIR VLV 2 annunciator on the MWS panel does come 'ON', do a check of the operational pressure of the overpressure switch connected to the flow control venturi (Ref. 21-10-76, 401 (Figure 401)). If this is serviceable replace PRSOV.		
NOTE		
Continued operation of the air conditioning system with the low-limit temperature control valve pipe disconnected could lead to the water separator icing and subsequent operation of the water separator relief valve. This is more likely to happen during hot and humid conditions.		
(12) Stop both airplane engines (Ref. 71-00-00, 501).	...	—
(13) On roof panel CG, set CABIN TEMP control to the COOL position.	...	—
(14) Remove all of the test equipment from the airplane. Reconnect the pipe disconnected at paragraph 2.A. (2).	...	—

B. Close Up

- (1) Make sure that the work area is clean, and clear of tools and other equipment.
- (2) Close the rear equipment bay access door.

OVER-PRESSURE SWITCH - DESCRIPTION AND OPERATION

1. Description

The over-pressure switch is a pneumatically actuated differential pressure switch. It has one set of electrical contacts which give an electrical signal when the contacts close at approximately 40 psi.

2. Operation

The switch senses the pressure of the hot bleed air downstream of the pressure regulator and shut-off valve (PRSOV) at the flow control venturi. When the sensing pressure from the flow control venturi reaches 40 ± 2 psi, the electrical signal from the switch initiates the closing of the right-hand main air valve. This will prevent excessive air flow into the environmental control unit (ECU) which would cause the air cycle motor (ACM), in the ECU, to overspeed.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION PRSOV OVERPRESSURE SWITCH MAINTENANCE PRACTICES

1. INFORMATION

Equipment/Material	Part/Item No.
Wire, corrosion resistant	651 (Chapter 20-95-601)
Pressure test rig (air) to 195 psig	Local supply
Test adapter	Local supply
500 Volt insulation tester	Local supply
Multimeter	Local supply
Electrical bonding tester	Local supply
Actuation/de-actuation electrical indication rig	Local supply (Ref. Figure 202)

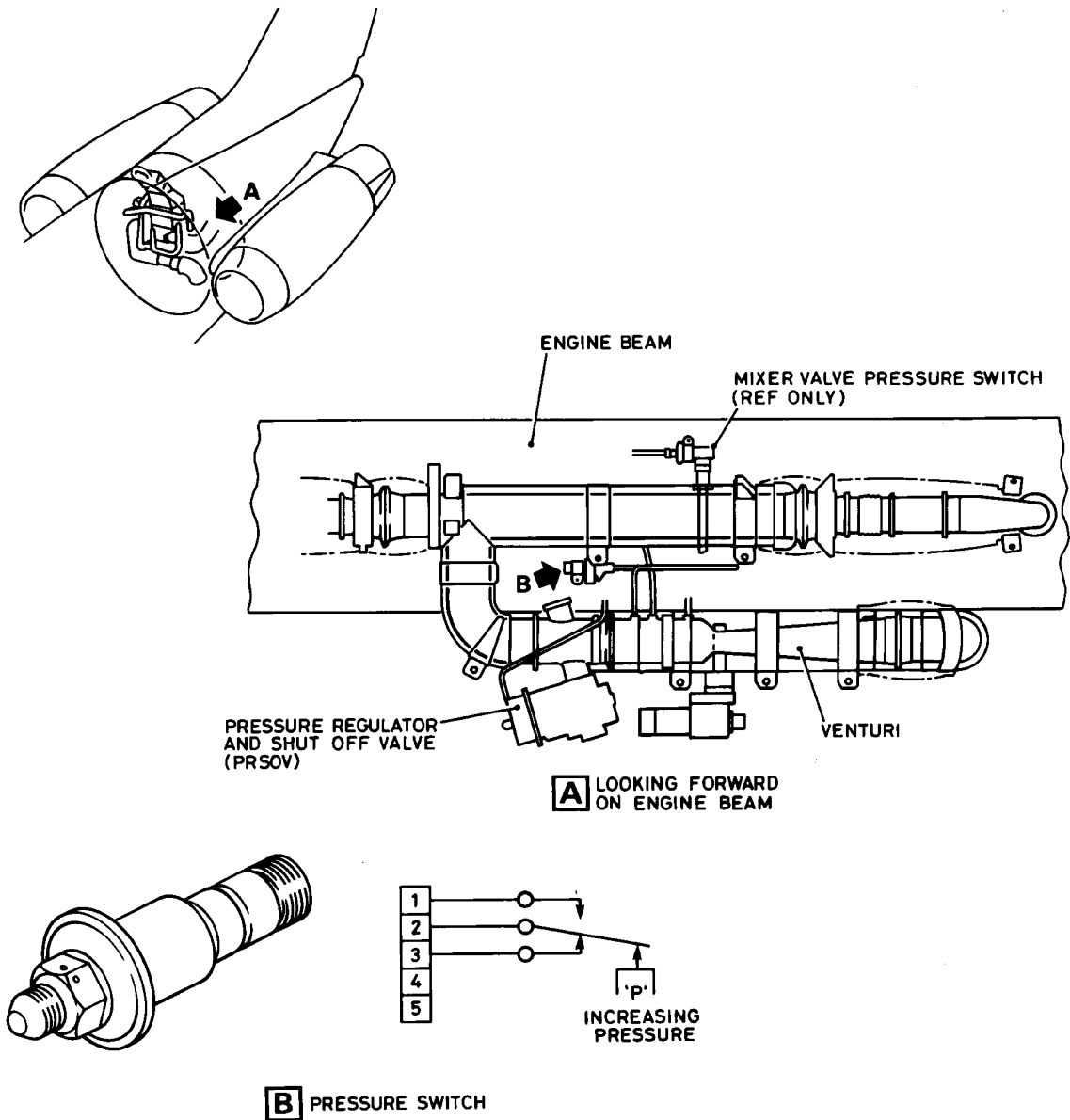
2. REMOVAL/INSTALLATION

A. Removal

	MECH	INSP
(1) On panel DA-D open, safety clip and tag circuit breaker MAIN AIR VLV 2 (Ref. 24-01-00, 201).		
(2) Put a warning notice in the flight compartment to prevent the use of the air conditioning system.		
(3) Open the rear equipment bay door.		
(4) Disconnect the electrical connector to the over-pressure switch (Ref. Figure 201). Install a protective blank to the electrical connector.		
(5) Cut and remove the lockwire and disconnect the pressure sensing pipe from the switch.		
(6) Remove the nut and bolt that holds the 'P' clip around the switch body.		
(7) Remove the switch and install blanks to the open pipe, air port and switch electrical connection.		

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



LEADING PARTICULARS

OPERATION ON INCREASING PRESSURE	40 +/- 2 psig
OPERATION ON DECREASING PRESSURE	35 psig
AMBIENT TEMPERATURE RANGE	- 54 TO +150 DEGREES C
OPERATING MEDIUM	AIR
SYSTEM PRESSURE	195 psig
ELECTRICAL RATING	100-200 MILLIAMPS LOAD AT 28 VDC

M2240

Figure 201
PRSOV Overpressure Switch - Location

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(1) Remove the blanks from the switch and the pipe.		
(2) Install the 'P' clip around the switch body. Attach the pressure switch to the bracket assembly and tighten the nut and bolt.		
(3) Connect the pipe to the switch and tighten. Lockwire (Item 651) the pipe nut to the switch.		
(4) Remove the blank from the electrical connector and connect to the switch.		
(5) Remove the safety clip and tag and close the circuit breaker opened in paragraph 2.A. (1).		
(6) Energize the airplane electrical busbars (Ref. 24-01-00, 201).		
(7) Remove the warning notice installed in the flight compartment in paragraph 2.A. (2).		
(8) Do a test of the air conditioning system to examine for leaks at the joints: (a) Start the engine (Ref. 71-00-00, 501). (b) On the overhead panel CG, set the MAIN AIR VLV 2 switch to OPEN. WARNING Air leaks from joints in the ducting will be at a high temperature. Be careful when you examine joints for leaks by hand. (c) Examine the disturbed joints for leaks by touch. (d) Set the MAIN AIR VLV 2 switch to CLOSE. (e) Stop the engine (Ref. 71-00-00, 501). (f) Close the rear equipment bay door.		
(9) De-energize the electrical busbars (Ref. 24-01-00, 201).		

(1) Make sure that the work area is clean and clear of tools and other equipment.

NOTE: The over-pressure switch must be tested at the times given in the Aircraft Flexible Maintenance Schedule or whenever it is functionally suspect. To do these tests, the over-pressure switch must be removed from the airplane.

- (1) Make sure that the electrical connector is bonded to the pressure switch housing by measuring the resistance between the threaded end termination and the connector. The resistance must not be more than 10 milliohms.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

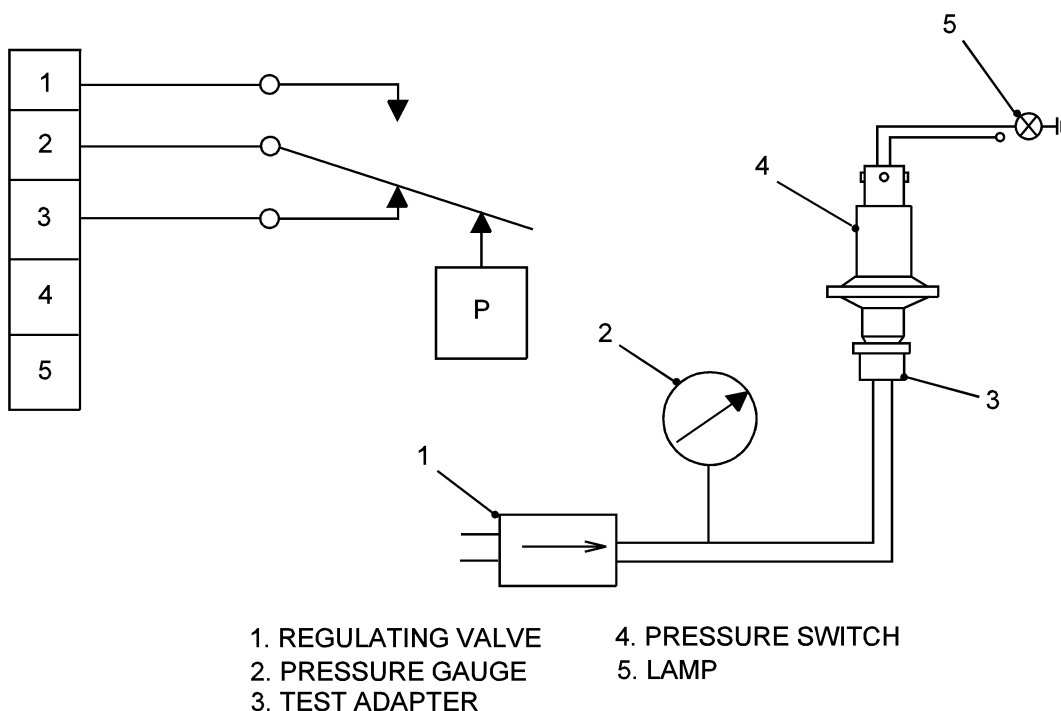


Figure 202
Test Rig Layout and Circuit Diagram

B. Insulation Breakdown Test

- (1) With the pressure switch de-actuated, connect one lead of the insulation tester to electrical connector pins 3 or 2 and the other lead to pin 1.
- (2) Slowly build up to a voltage of 500 Vd.c. over a period of 20 seconds and, once attained, hold for 1 minute. There must not be any significant decrease indicated on the voltmeter.
- (3) Actuate the pressure switch and repeat the test with one tester lead connected to pins 2 or 1 and the other lead to pin 3.

C. Insulation Resistance Test

- (1) De-actuate the switch and use the 500 volt insulation tester to measure the insulation resistance between electrical connector pins 1 and 3 and between each pin and the pressure switch housing.
- (2) Do a check of the continuity between pins 2 and 3. This is to be less than 50 milliohms.
- (3) Actuate the switch and use the 500 volt insulation tester to measure the insulation resistance between electrical connector pins 2 and 3 and between each pin and the pressure switch housing.
- (4) Do a check of the continuity between pins 1 and 2. This is to be less than 50 milliohms

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

NOTE: The duration of the insulation test is to be 30 seconds, or until a steady instrument reading is obtained. The test potential is to be $500 \pm 10\%$ Vd.c. and the insulation resistance not less than 1000 megohms.

D. Operational Test

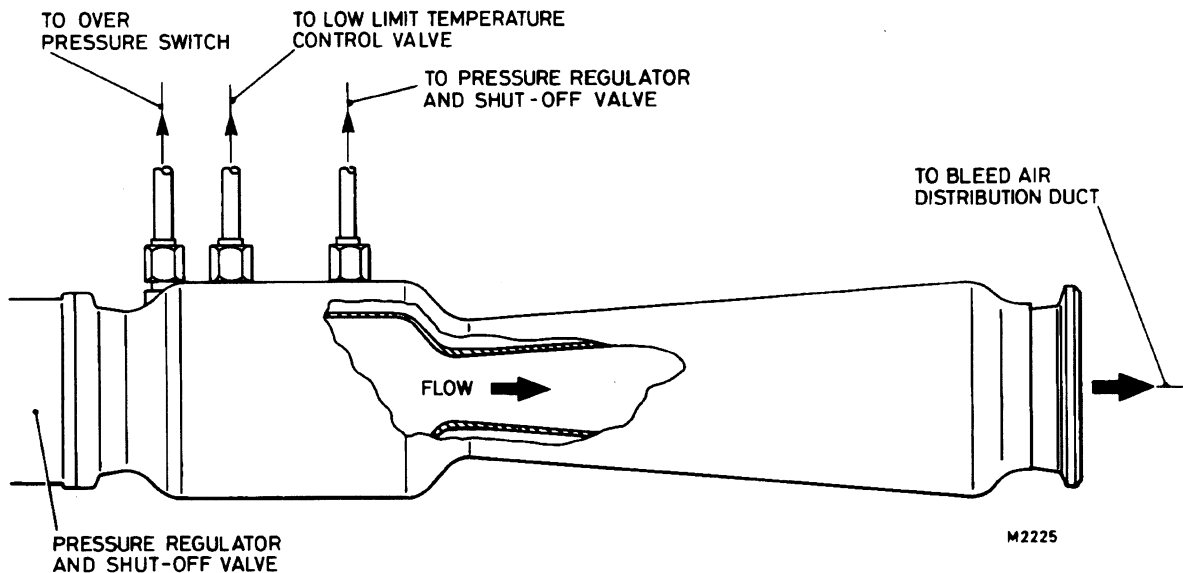
- (1) Connect the electrical supply to the electrical connector (Ref. Figure 202). The de-actuation lamp comes 'ON'.
- (2) Slowly apply a pressure until the pressure switch is actuated. The actuation lamp comes 'ON' and the de-actuation lamp goes 'OFF'. Make sure that the actuation pressure occurs at 40 ± 2 psig. Record the actuation pressure.
- (3) Slowly increase the pressure to 195 psig. Hold this pressure for 1 minute.
- (4) Slowly decrease the pressure until the pressure switch is de-actuated. The de-actuation lamp comes 'ON' and the actuation lamp goes 'OFF'. Make sure that the de-actuation pressure occurs at 35 psig. Record the de-actuation pressure.
- (5) Do paragraphs 3.D. (2) thru (4) several times to make sure that the readings obtained are consistent.
- (6) Install serviceable switches to the airplane as necessary (Ref. paragraph 2.B.).

FLOW CONTROL VENTURI - DESCRIPTION AND OPERATION

1. Description (Figure 1)

The flow control venturi is a stainless steel welded assembly, covered with lagging and has three pipe unions welded to it. Each union has a metering hole drilled through into the venturi. The venturi has no moving parts and is connected into the system with V-clamps. A pressure sensing pipe is connected to each union and each pipe goes to a component in the bleed air system. The components are:

- (1) The pressure regulator and shut-off valve (PRESSURE REGULATOR AND SHUT OFF VALVE (PRSOV)).
- (2) The over-pressure switch (OVER PRESSURE SWITCH).
- (3) The low-limit temperature control valve (LOW LIMIT TEMPERATURE CONTROL VALVE).



Flow control venturi
Figure 1

ENVIRONMENTAL CONTROL UNIT (ECU) - DESCRIPTION AND OPERATION

1. Description *(Figure 1)*

The Environmental Control Unit (ECU) has a dual heat exchanger assembly, a three wheel air cycle machine (ACM) and a low limit temperature control valve.

The heat exchanger assembly is a single unit, split so that approximately one third of the unit functions as the primary heat exchanger and two thirds as the secondary heat exchanger with the two cores in parallel on the ram air cooling side.

The primary and secondary heat exchangers are single-pass crossflow. Air leaving the turbine is mixed with hot air from the outlet of the primary heat exchanger. The flow is controlled by the low limit temperature control valve to maintain the temperature of supply air into the water separator as low as possible, but not below 35 deg.F (1.7° C) (nominal) to prevent icing.

The air cycle machine (ACM) has three wheels mounted on a common shaft; the turbine wheel, the compressor impeller and the fan impeller. The turbine and fan are mounted onto each end of the rotating assembly with the compressor located in the middle. The shaft is supported on air bearings designed to operate without scheduled maintenance. No lubrication system is required for this type of bearing.

The low limit temperature control valve controls the ECU cold air outlet to a minimum of 35° F (1.7° C) (nominal) (Chapter 21, TEMPERATURE CONTROL).

2. Operation

Bleed air entering the ECU passes first through the primary section of the heat exchanger where it is cooled. The air then enters the compressor component of the three wheel ACM and undergoes an increase of pressure and temperature in the compression process. When the air leaves the compressor, the air flows through the secondary section of the heat exchanger where it is cooled to nearly the temperature of the ambient cooling air.

The bleed air is then expanded through the turbine of the ACM. This expansion process not only reduces the bleed air temperature to well below that of the ambient air but also produces shaft power to drive the compressor and the fan. The air is conditioned to 35° F (1.7° C) (nominal) by the low limit temperature control valve and then exits into the water separator, silencer and through a non-return valve into the cabin.

Approximately 70 percent of the power produced by the turbine is absorbed by the compressor, the remaining 30 percent is absorbed by the fan. The main function of the fan is to provide ambient cooling air to the heat exchanger assembly during ground operation.

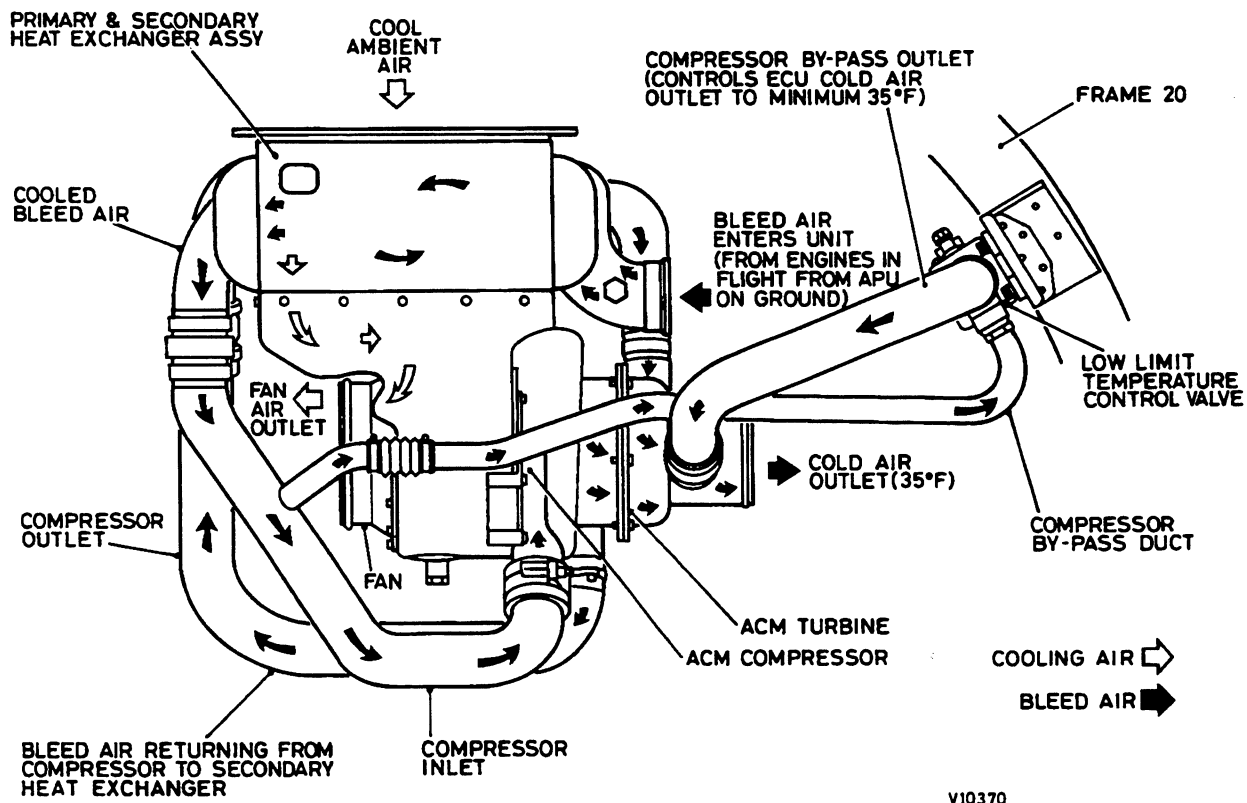
In flight, bleed air from each engine HP compressor or LP compressor (or both) passes through the engine venturis and is ducted to the mixing valves. Just upstream of the mixing valves, the HP air passes through the high-pressure (HP) shut-off valves. Bleed air flows from the mixing valves through main air valves and non-return valves to the pressure regulator and shut-off valve.

The HP valves open only when the LP bleed air pressure drops below 30 psi, however, it can be closed by selecting LP ON on the MAIN AIR VLV switches on the flight deck overhead panel. Selecting LP ON closes the HP valves but maintains the low-pressure bleed air supply.

The mixing valves limit the HP bleed air to a nominal pressure of 20 ± 2 psi. The pressure regulator is provided with temperature compensation to keep bleed air flow in a specified temperature range. When a mixing valve outlet air temperature exceeds 392°F (200°C), the thermal compensator will begin to limit the HP flow.

The non-return valves prevent back flow in case of unequal engine bleed air pressure.

The pressure regulator and shut-off valve regulates the downstream bleed air pressure to 27.5 ± 2.5 psi and the rotating speed of the ACM.



Environmental control unit (ECU)

Figure 1

EFFECTIVITY:

800XP

21-10-87

Page 2

July 95

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION ENVIRONMENTAL CONTROL UNIT (ECU) TROUBLESHOOTING

1. TROUBLESHOOTING

Fault	Probable Cause	Remedy
ECU discharge temperature too high	Obstruction in heat exchanger cooling air duct	Locate and remove obstruction
	Defective air cycle machine (ACM)	Replace ACM
	Defective heat exchanger assembly	Replace heat exchanger assembly
	Leaking duct joints or gaskets	Tighten loose joints
	Low limit temperature control valve (LLTCV) jammed open	Replace LLTCV
	Low limit temperature sensor reading false low	Replace sensor
	Low limit temperature controller defective	Replace controller
	Cabin temperature control valve failed open	Replace valve
	Cabin temperature sensor reading low	Replace sensor
	Cabin temperature controller defective	Replace temperature controller
ECU discharge temperature too low	Cabin temperature sensor reading high	Replace sensor
	LLTCV failed closed	Replace LLTCV
	Blockage in the air pipe providing sense air to the LLTCV	Clear blockage
	Cabin temperature control valve failed closed	Replace cabin temperature control valve
	Cabin temperature controller defective	Replace temperature controller
ECU will not start	Rotor static breakaway torque in excess of 80 ounce inch	Replace ACM
	PRSOV failed closed	Replace PRSOVs

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION ENVIRONMENTAL CONTROL UNIT (ECU) MAINTENANCE PRACTICES

1. INFORMATION

Equipment/Material	Part/Item No.
Sealant	361 (Ref. 125/H-20, 20-95-301)
Torque wrench capable of 20 to 40 lb in. (2.26 to 4.52 Nm)	Local supply
Torque wrench capable of 20 to 50 lb in. (2.26 to 5.65 Nm)	Local supply
Torque wrench capable of 0 to 80 ounce inches	Local supply
3/8 inch drive extension	Local supply
3/8 inch deep 12 point socket	Local supply
Shop vacuum cleaner	Local supply

2. REMOVAL/INSTALLATION

A. ACM Removal

	MECH	INSP
(1) Make sure the airplane power is off (Ref. 24-01-00, 201).		
(2) Remove the rear equipment bay door from the airplane.		
(3) Disconnect the water injector nozzle feed pipe from the water separator (Ref. Figure 201 and Figure 202).		
(4) Loosen the securing clamps and remove the water separator from the unit.		
(5) Loosen and disconnect the securing clamp, unbolt the flange and remove the silencer-mixer duct assembly from the unit.		
(6) Loosen the securing clamps and disconnect the ACM turbine outlet ducting.		
(7) Loosen the securing clamps and disconnect the ACM exhaust (fan) outlet ducting.		
(8) Disconnect the water injector nozzle feed pipe from the heat exchanger turbine inlet port.		
(9) Disconnect the three servo air supply pipes from the flow control venturi to the following: (a) The pressure regulator and shut-off valve. (b) The over-pressure switch. (c) The low-limit temperature control valve.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(10) Unbolt supporting 'P' clips for servo air supply pipe and remove pipe from the unit.		
(11) Disconnect ducting by-pass feed from compressor inlet duct to low-limit temperature control valve as follows: (a) Unscrew the nut. (b) Loosen the bellows clamp.		
(12) Disconnect the ducting from the low-limit temperature control valve to the ACM turbine outlet as follows: (a) Loosen the bellows clamp. (b) Remove and discard the four split pins which secure the ducting to the low-limit temperature control valve. (c) Unbolt the low-limit temperature control valve from the frame and separate from the ducting, discard the special step washers. (d) Discard O-ring seal and remove both assemblies from the unit.		
(13) Loosen and remove the securing clamps at the heat exchanger outlet port and the ACM compressor inlet port. Remove the connecting ducting from the unit.		
(14) Unbolt and remove the securing clamps at the heat exchanger inlet port and the ACM compressor outlet port. Remove the connecting ducting from the unit.		
(15) Loosen and remove the securing clamp at heat exchanger outlet port and the ACM turbine inlet port.		
(16) Release the V-clamp securing the ducting to the heat exchanger bleed air inlet port. Remove the ducting from the unit. Discard the seal.		
WARNING The ACM must be safely supported at this stage.		
(17) Remove the bolts securing the ACM to the support bracket.		
(18) Remove the bolts connecting the ACM plenum chamber to the heat exchanger assembly.		
(19) Remove the ACM.		
(20) Blank off the open ducts and the unit connections.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

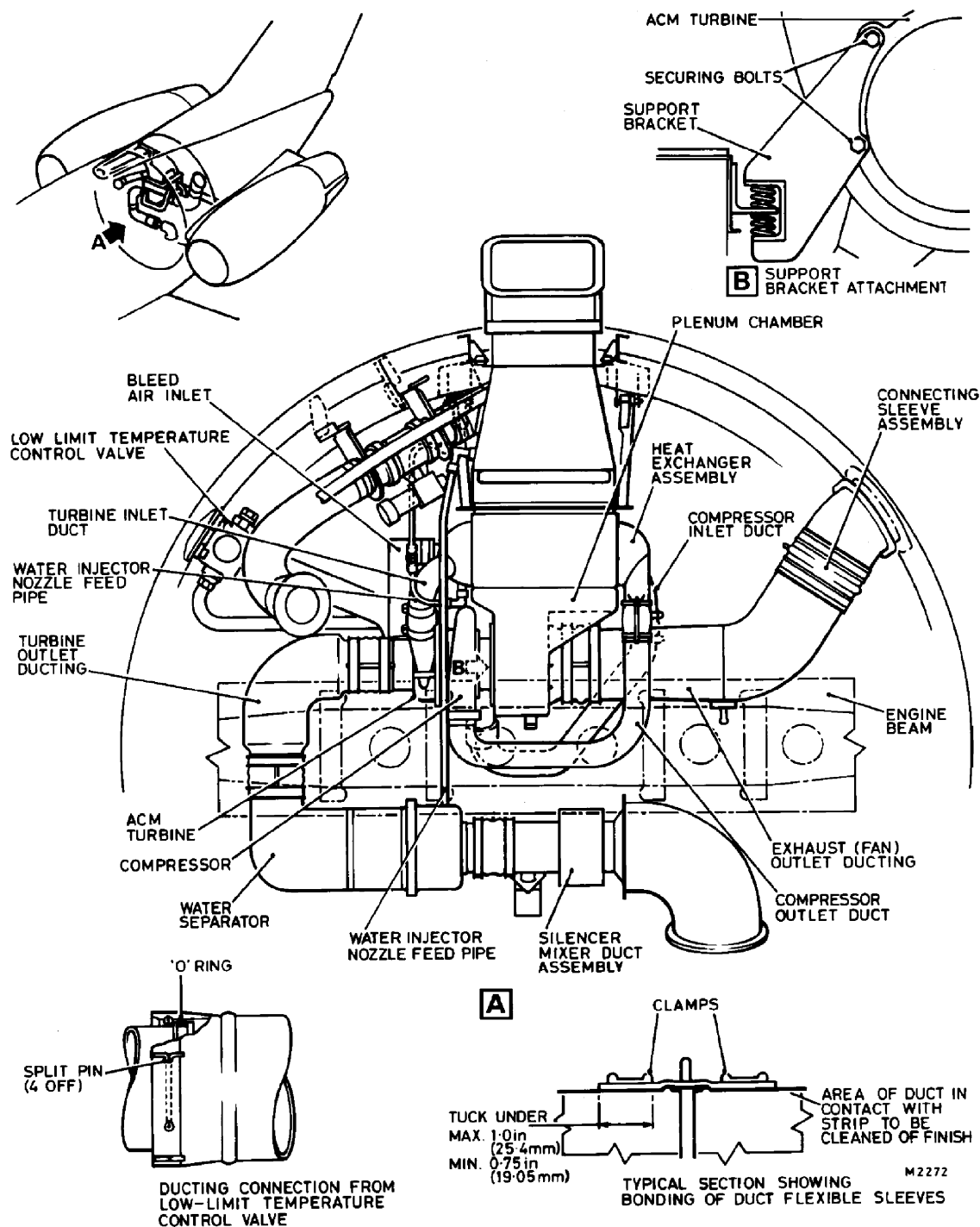


Figure 201
Environmental Control Unit (ECU) - Removal/Installation

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

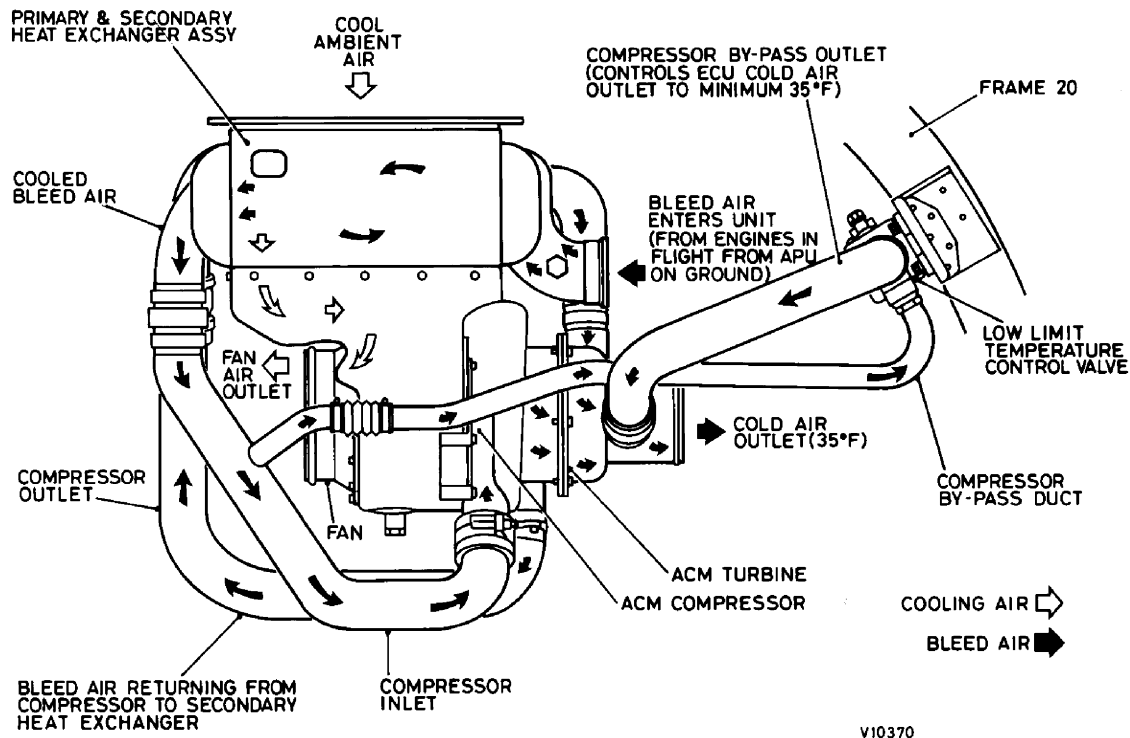


Figure 202
Environmental Control Unit - Removal/Installation

B. ACM Installation

	MECH	INSP
(1) Remove the blanks from the open ducts and the unit connections.		
(2) Make sure that all traces of unwanted sealant are removed from the ACM plenum chamber/heat exchanger mating surfaces.		
(3) Apply a bead of sealant (Item 361) to the ACM plenum chamber/heat exchanger mating surfaces.		
(4) Safely support and position the ACM for bolting to the heat exchanger assembly.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(5) Install and tighten the bolts which secure the ACM plenum chamber to the heat exchanger assembly. Torque load the bolts to 20 lb in. (2.26 Nm). Remove any unwanted sealant.		
(6) Install and tighten the bolts which secure the ACM to the support bracket. Install the washers under the heads and between the bracket and unit. Torque load the bolts to 45 to 50 lb in. (5.08 to 5.65 Nm).		
(7) Install new MARMAN seal, and install and tighten the V-clamp which secures the ducting to the heat exchanger bleed air inlet port. Torque load the V-clamp to 40 to 50 lb in. (4.52 to 5.65 Nm).		
(8) Install and tighten the securing clamp which connects the heat exchanger outlet port to the ACM turbine inlet port.		
(9) Position the ducting on the unit. Install and tighten the securing clamp at the ACM compressor outlet port, torque load the clamp to 20 to 25 lb in. (2.26 to 2.82 Nm). The clamp at the heat exchanger inlet port must be tightened until the end play is the minimum which will allow finger rotation of the stud.		
(10) Position the ducting on the unit. Install and tighten the securing clamps at the heat exchanger outlet port and the ACM compressor inlet port. Torque load the compressor inlet clamp to 45 to 50 lb in. (5.08 to 5.65 Nm).		
(11) Secure the low-limit temperature control valve ducting feed to the ACM turbine outlet as follows: (a) Install and tighten the bolts which secure the low-limit temperature control valve to the frame. Make sure the new special step washers are under the bolt heads and are positioned correctly. (b) Install a new O-ring seal and position the ducting to the valve. Secure with four new split pins (Ref. Figure 201). (c) Tighten the bellows clamp which connects the ducting to the ACM turbine outlet.		
(12) Position the ducting which connects the by-pass feed from the compressor inlet to the low-limit temperature control valve. Tighten the nut and tighten the bellows clamp.		
(13) Connect and tighten the three servo air supply pipes from the flow control venturi to the following: (a) The pressure regulator and shut-off valve. (b) The over-pressure switch. (c) The low-limit temperature control valve.		
(14) Tighten the servo air supply pipe 'P' clips.		
(15) Connect and tighten the water injector nozzle feed pipe to the heat exchanger turbine inlet port.		
(16) Connect the ACM exhaust (fan) outlet ducting. Tighten the securing clamp and torque load to 25 to 30 lb in. (2.82 to 3.39 Nm).		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(17) Connect the ACM turbine outlet ducting to the unit. Tighten the attachment clamp and torque load to 25 to 30 lb in. (2.82 to 3.39 Nm).		
(18) Connect the silencer mixer duct assembly to the unit. Install and tighten the flange bolts. Install and tighten the securing clamp. Torque load the securing clamp to 25 to 30 lb in. (2.82 to 3.39 Nm).		
(19) Connect the water separator to the unit. Tighten the securing clamps and torque load to 25 to 30 lb in. (2.82 to 3.39 Nm).		
(20) Connect the water injector nozzle feed pipe to the water separator. Tighten the nut.		
(21) Energize the airplane busbars (Ref. 24-01-00, 201).		
(22) Do a test of the air conditioning system to examine for leaks at the joints disturbed (Ref. 21-10-15, 201).		
(23) Do a functional test of the temperature control system (with air supplies) (Ref. 21-60-00, 501).		
(24) Install rear equipment bay door and function test as follows: (a) Turn rear equipment bay light switch to the 'ON' (down) position and make sure light is ON. (b) Close the door, REAR BAY DOOR annunciator on overhead panel 'CG' goes OFF. (c) Open the door, REAR BAY DOOR annunciator on overhead panel 'CG' comes ON. (d) Make sure that the rear equipment bay light switch is in the OFF (up) position and the light is OFF. (e) Close the door, REAR BAY DOOR annunciator on overhead panel 'CG' goes OFF.		
(25) De-energize the airplane busbars (Ref. 24-01-00, 201).		

C. Close Up

	MECH	INSP
(1) Make sure that the work area is clean and clear of tools and other equipment.		

D. Cooling Turbine Removal (P/N 2205490 Series)

NOTE: The following instructions detail the procedure to remove the cooling turbine only; the plenum chamber remains in the airplane.

NOTE: Refer to 21-10-15, 201 for the procedures to disconnect the pipes and ducting.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

NOTE: Refer to Figure 203, Figure 204, Figure 205 and Figure 206 when removing the Cooling Turbine.

	MECH	INSP
(1) Make sure the airplane busbars are de-energized (Ref. 24-01-00, 201).		
(2) Put a notice in the flight compartment to prohibit the use of the air conditioning system.		
(3) Open the rear equipment bay door.		
(4) Remove access panel F170 (Ref. AFMS-800XP, Part 6), located in the fuselage above the RH engine pylon.		
(5) Remove the Pressure Regulator and Shut-off Valve (PRSOV) (Ref. 21-10-76, 401).		
(6) Remove the Auxiliary Heating Valve with lines (Ref. 21-60-105, 201).		
NOTE Where the following procedures require air ducting or electrical connectors to be disconnected and/or removed; suitable blanks or protection is to be installed to protect from damage and ingress of foreign objects.		
(7) At the cabin inlet air duct, disconnect the following electrical connectors:		
(a) The duct temperature bulb "QA".		
(b) The duct over-temperature switch "US".		
(c) The duct temperature sensor "UT".		
(8) Loosen the duct clamp and sleeve clips on the cabin inlet air duct assembly and remove the duct from the airplane.		
(9) Remove the 16 stiffnuts, washers and bolts, securing the cabin inlet air lagged duct assembly to the silencer-mixer duct assembly. Retain the re-inforcing rings with the lagged-duct assembly and remove the lagged-duct assembly from the airplane.		
(10) At the top of the support strut for the silencer-mixer assembly, loosen the nut and bolt that holds the support strut to the angle bracket. Secure the strut clear of the removal path for the cooling turbine.		
(11) At the bottom of the water separator, loosen the hose clip and disconnect the flexible pipe line from the water separator drain connector.		
(12) At the silencer-mixer duct assembly, disconnect the electrical connector at the low limit temperature control sensor "ZR".		
(13) Loosen the clamps and disconnect the sleeves between the water separator and the silencer-mixer duct assembly from the airplane.		
(14) Loosen the clamps and disconnect the sleeve at the turbine outlet duct.		
(15) Remove the nut and the securing strap from the water separator. Remove the water separator complete with the turbine air discharge duct from the airplane.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(16) At the water injector nozzle (located at the RH side of the ram air duct): (a) Disconnect the HP pipeline. (b) Disconnect the opposite end of the HP pipeline (routed down to the heat exchanger turbine inlet port). (c) Remove the pipe from the airplane.		
(17) At the cooling turbine, loosen the duct clamps and disconnect the following items: (a) Compressor outlet duct. (b) Compressor inlet duct. (c) Turbine inlet duct. (d) De-icing inlet duct (duct from LLTCV).		
(18) At the cooling turbine, support the weight of the cooling turbine and remove the 6 bolts and washers securing the cooling turbine to the plenum housing.		
NOTE Two persons are required to remove the cooling turbine from the airplane. Access to the lower bolts is from within the rear equipment bay and access to the upper bolts is through panel F170 in the RH side of the fuselage. NOTE Two of the bolts secure the cooling turbine assembly to the cooling turbine mounting bracket. The mounting bracket is attached to the engine beam and stays on the airplane. (19) With one person inside the rear equipment bay and with assistance from a second person through the access panel on the RH side of the fuselage; remove the cooling turbine as follows: (a) Carefully remove the cooling turbine outboard from the plenum housing. (b) Turn the cooling turbine carefully through 180° so that the fan end of the cooling turbine is uppermost. (c) Lower the cooling turbine through the space cleared by the preceding operations, taking care not to damage the cooling turbine or components en-route. (d) Remove the cooling turbine from the airplane.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

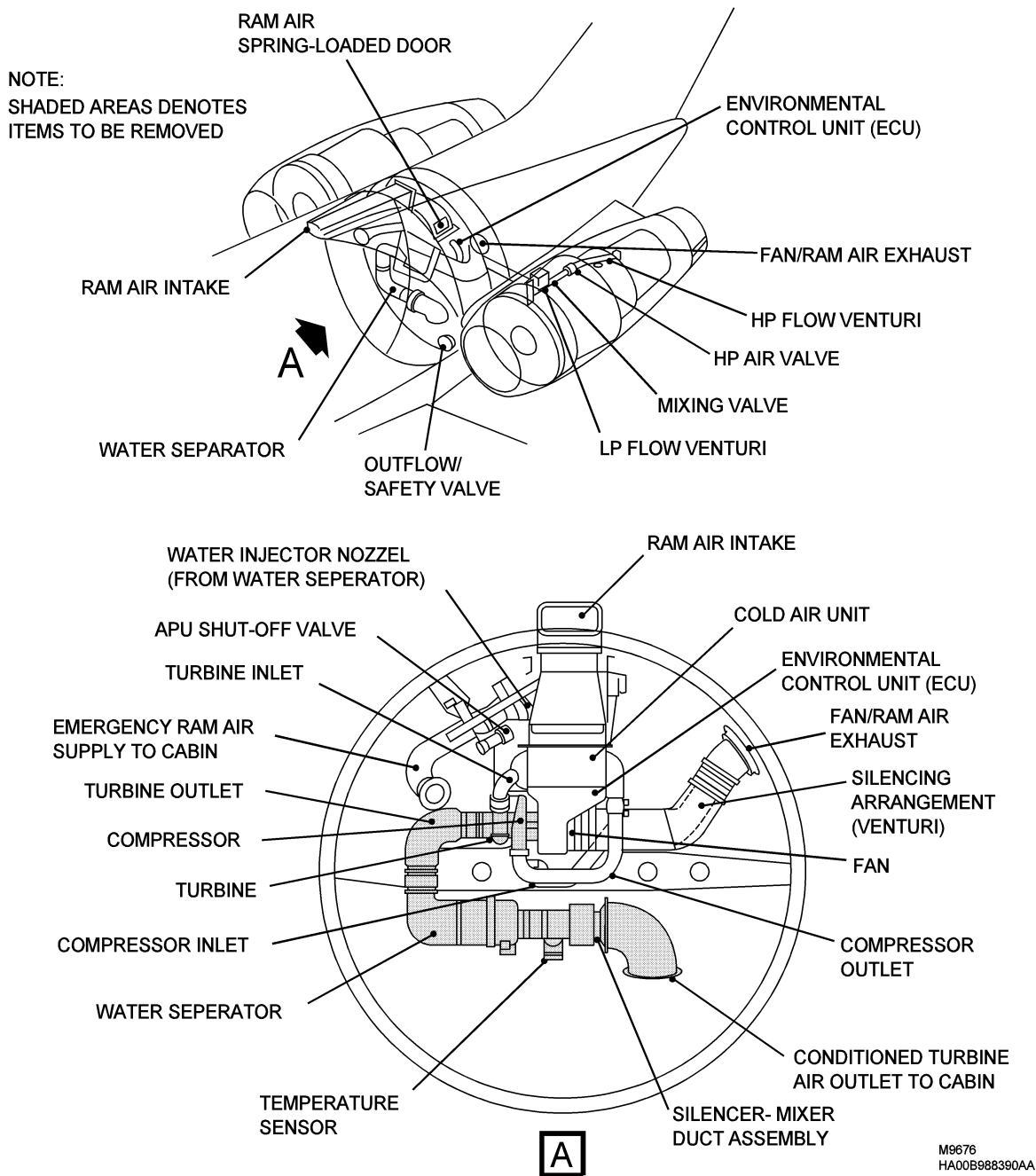
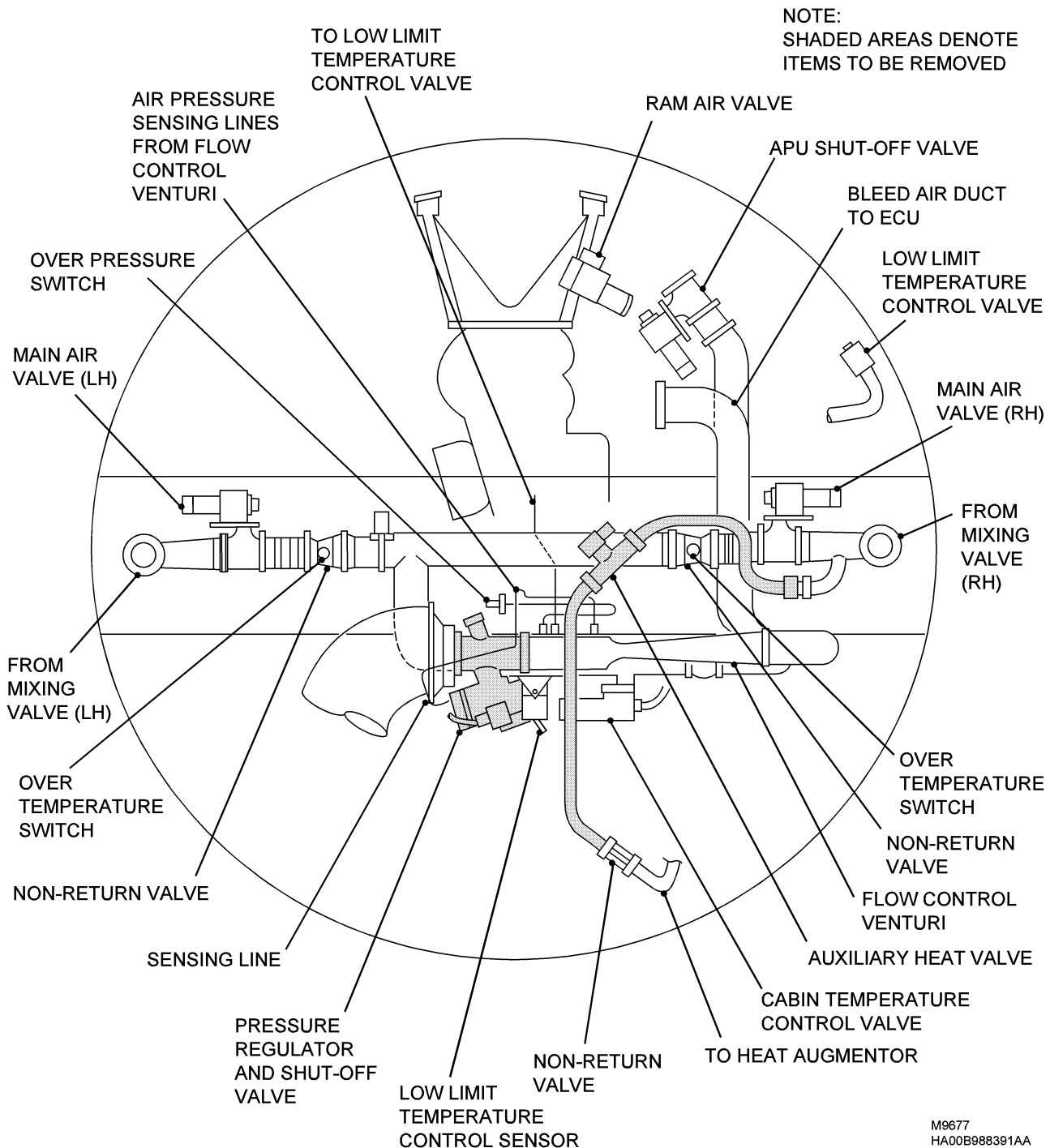


Figure 203
Part of Air Conditioning System in Rear Equipment Bay

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



M9677
HA00B988391AA

Figure 204
Part Bleed Air System in Rear Equipment Bay

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

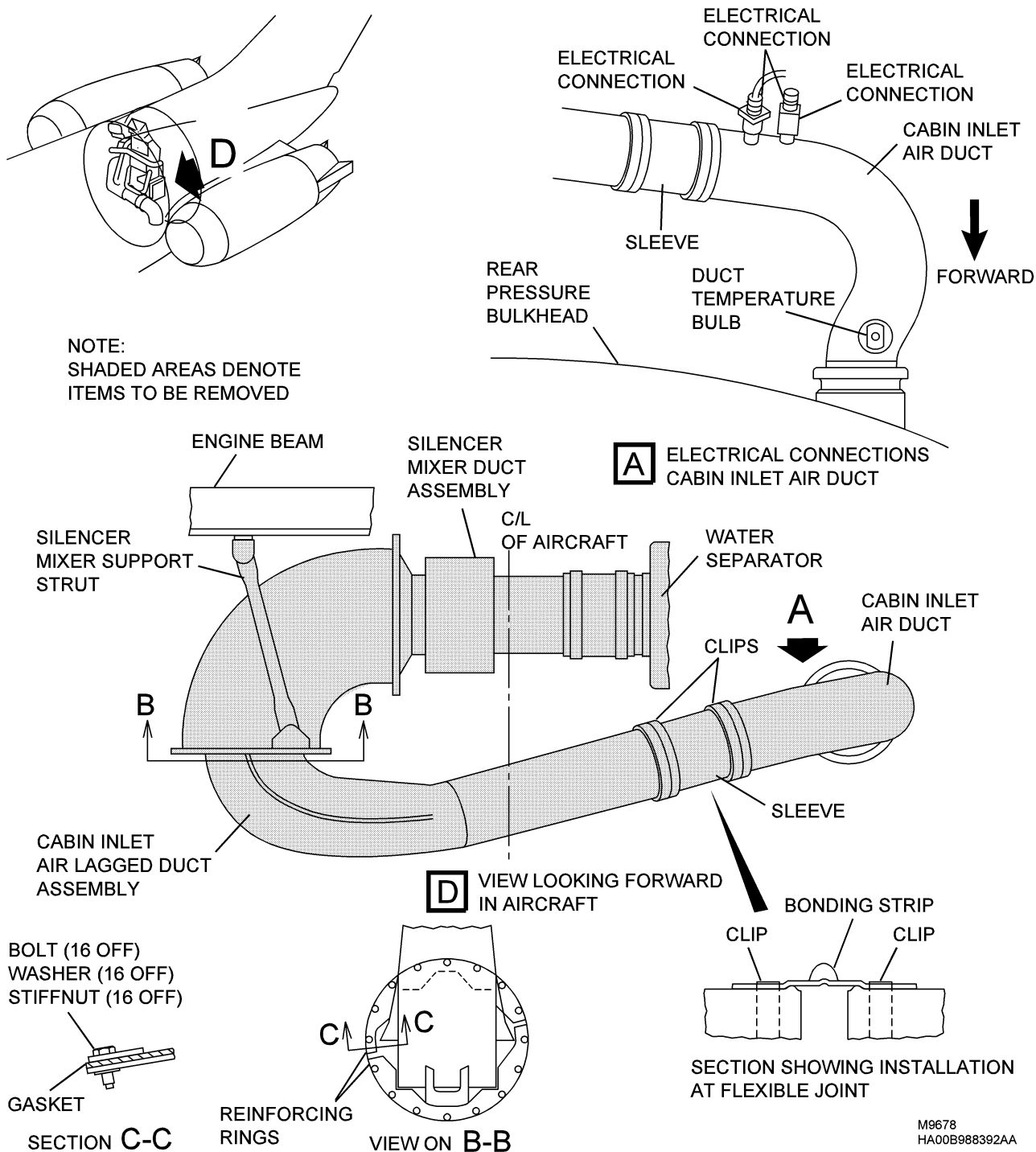


Figure 205
Cabin Air Inlet Duct

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

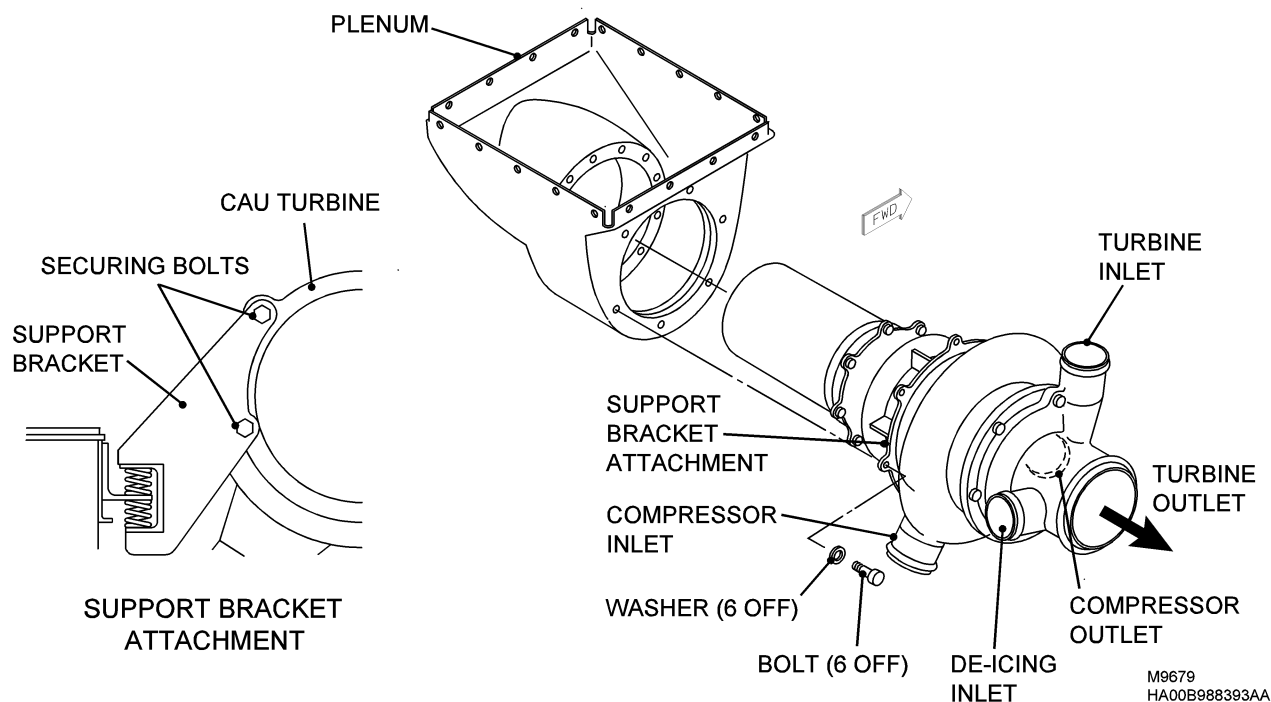


Figure 206
Cold Air Unit/Plenum connection

E. Cooling Turbine Installation (P/N 2205490 Series)

NOTE: Installation of the cooling turbine is the reverse of the removal procedures. Two persons are required to install the cooling turbine into the airplane.

NOTE: Refer to 21-10-15, 201 for the procedures to assemble the pipes and ducting.

NOTE: Refer to Figure 203, Figure 204, Figure 205 and Figure 206 when installing the Cooling Turbine.

	MECH	INSP
(1) Remove the blanks from the cooling turbine and the related airplane ducting.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(2) With one person inside the rear equipment bay and with assistance from a second person through the access panel on the RH side of the fuselage; install the cooling turbine as follows: (a) Carefully lift the cooling turbine into the rear equipment bay with the fan end of the cooling turbine uppermost. (b) Move the cooling turbine into the space outboard, and to the right of the ram air ducting, turn the cooling turbine so that the fan end of the unit is positioned ready to enter the plenum housing. (c) Move the cooling turbine into the plenum housing and align the 6 bolt holes. Make sure that the cooling turbine outlet ports align with the related ducts.		
(3) Install the two bolts and washers that secure the cooling turbine to the mounting bracket. NOTE Do not fully tighten at this time.		
(4) Install the remaining 4 bolts and washers.		
(5) Torque tighten all 6 bolts to between 45 and 50 lb in. (5.08 and 5.65 Nm).		
(6) At the cooling turbine, assemble the following ducts to their related outlet ports; install and torque tighten the duct clamps to between 25 to 30 lb in. (2.8 to 3.4 Nm) (Ref. 21-10-15, 201). (a) Turbine inlet duct. (b) De-icing inlet duct (LLTCV duct). (c) Compressor inlet duct. (d) Compressor outlet duct.		
(7) At the water injector nozzle, remove the blanks and install the water drain pipe routed from the water separator.		
(8) Remove the blanks from the HP pipe line. Install the HP pipe line and connect at the water injector nozzle and at the heat exchanger turbine inlet port.		
(9) Remove the blanks from the water separator and turbine outlet duct. Assemble the duct clamp and sleeve clips and install the water separator complete with the turbine outlet duct. Torque tighten the clamps and clips to between 25 to 30 lb in. (2.8 to 3.4 Nm). NOTE Make sure that the water separator water drain outlet is at the lowest point on the water separator when assembled.		
(10) Remove the blank and install the water drain flexible hose to the water separator water drain. Torque tighten the hose clip to between 25 to 30 lb in. (2.8 to 3.4 Nm).		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(11) Remove the blanks from the silencer-mixer duct assembly. Install the silencer-mixer duct assembly and torque tighten the sleeve clips to between 25 to 30 lb in. (2.8 to 3.4 Nm).		
(12) Remove the blanks; install the electrical connector to the low-limit temperature control sensor "ZR".		
(13) Remove the blanks; install the cabin inlet air lagged duct assembly to the silencer mixer duct.		
(14) Position the silencer mixer support strut and install the 16 bolts, washers and stiffnuts; tighten fully.		
(15) Tighten the nut and bolt at the top angle bracket of the silencer mixer support strut.		
(16) Remove the blanks from the cabin inlet air duct assembly, assemble the duct clamp and sleeve clips. Torque tighten the sleeve clips to between 25 and 30 lb in. (2.8 and 3.4 Nm) and the duct clamp to between 35 to 40 lb in. (3.95 to 4.52 Nm).		
(17) At the cabin inlet air duct assembly, remove the blanks and connect the electrical connectors to: (a) The duct temperature bulb "QA". (b) The duct over-temperature switch "US". (c) The duct temperature sensor "UT".		
(18) Install the pressure regulator and shut-off valve (PRSOV) (Ref. 21-10-76, 401).		
(19) Install the auxiliary heating valve with lines (Ref. 21-60-105, 201).		
(20) Make sure that the working area is clean and clear of tools and miscellaneous items of equipment.		
(21) Remove the warning notice installed in the flight compartment at paragraph 2.C.(2).		
WARNING		
Any air leaks from the disturbed joints will be at high temperature. Be careful when examining for leaks by feel of hand.		
(22) Do a test of the air conditioning system to examine for leaks at the joints disturbed during the above operations (Ref. 21-10-15, 201).		
(23) Do a functional test of the temperature control system (with air supplies) (Ref. 21-60-00, 501).		
(24) Install access panel F170, removed at paragraph 2.D.(4).		
(25) Close the rear equipment bay door, REAR BAY DOOR annunciator on overhead panel "CG" goes OFF.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

F. Close Up

	MECH	INSP
(1) Make sure that the work area is clean and clear of tools and other equipment.		

3. CLEANING ENVIRONMENTAL CONTROL UNIT (ECU) PRIMARY/SECONDARY HEAT EXCHANGER

A. Procedure

NOTE: The following instructions detail the procedure to clean the ECU primary/secondary heat exchanger without removing the heat exchanger assembly and plenum chamber.

NOTE: Two persons are required for the cleaning of the ECU primary/secondary heat exchanger. As one person uses compressed air to blow contaminants out of the heat exchanger the second person collects the contaminants using a shop vacuum cleaner.

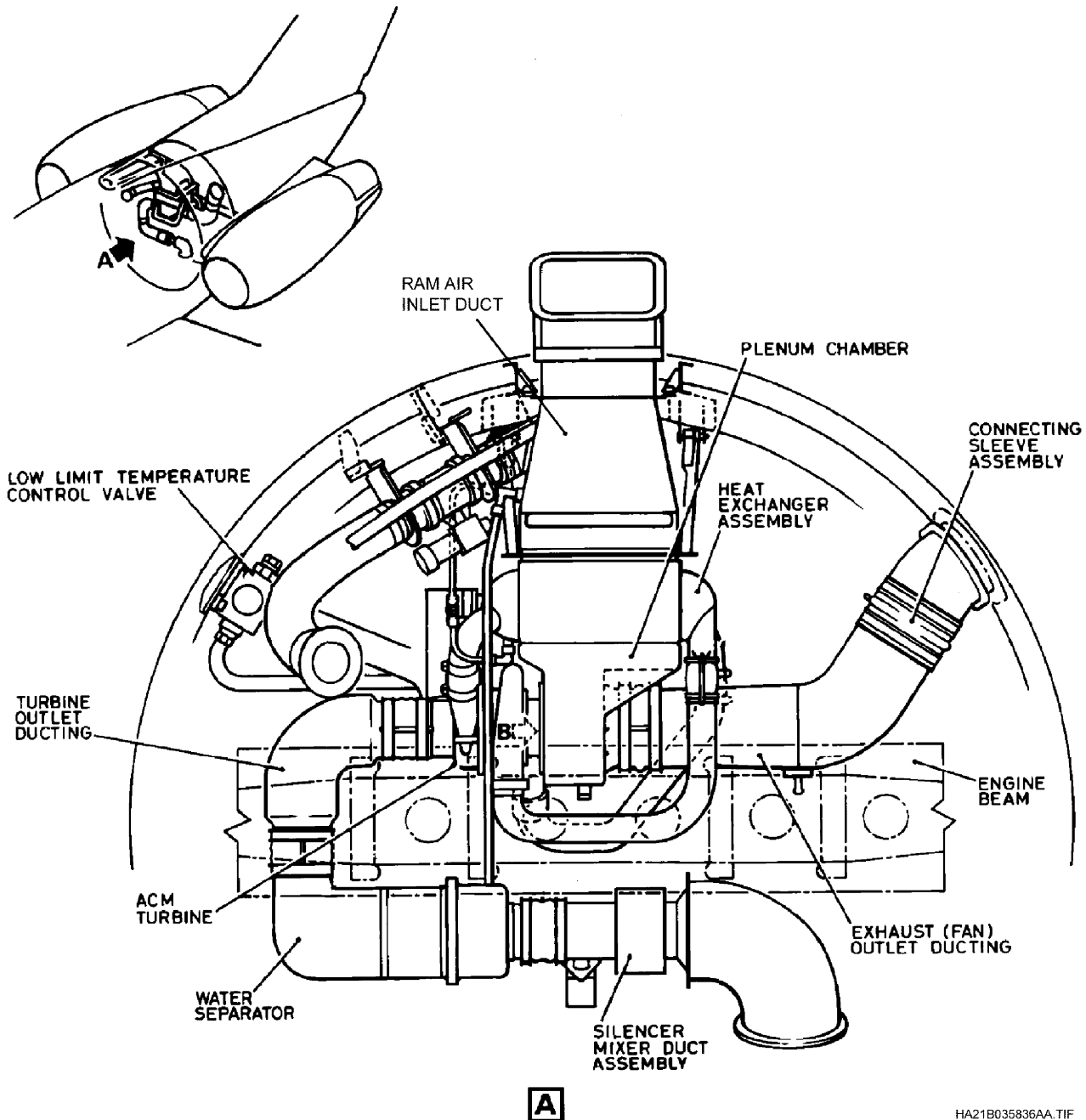
NOTE: If the following cleaning procedure fails to restore the cooling performance of the ECU, do the ECU troubleshooting procedure (Ref. 21-10-87, 101).

- (1) Remove the cooling turbine (P/N 2205490) (Ref. Paragraph 2.D.).
- (2) Remove the APU access panel F169 (Ref. AFMS-800XP, Part 6) above the left engine pylon to get access to the ram air inlet duct access door located on the left side of the ram air inlet duct (Ref. Figure 207, Sheet 2).
- (3) Use a shop vacuum cleaner to remove dirt and other loose contaminants from the top surface of the ECU primary/secondary heat exchanger by the use of access through the ram air inlet duct access door.

WARNING: Use correct personal protection equipment when you work with compressed air. Do not point the air stream at your eyes, skin or other personnel.

- (4) With the cooling turbine removed, access the bottom surface of the primary/secondary heat exchanger with a compressed shop air nozzle (Ref. Figure 207, Sheet 1).
- (5) Move the compressed shop air nozzle around the bottom of the primary/secondary heat exchanger to blow contaminants to the top surface of the heat exchanger.
- (6) Use the shop vacuum cleaner, through the ram air inlet access door, to remove any contaminants that are blown out of the primary/secondary heat exchanger.
- (7) Do again paragraphs 3.A. (5) and (6) until all contaminants are removed.
- (8) Clean the plenum chamber of any contaminants.
- (9) Install the cooling turbine (P/N 2205490) (Ref. Paragraph 2.E.).
- (10) Install the APU access panel F169 above the left engine pylon.

Hawker Beechcraft Corporation
HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

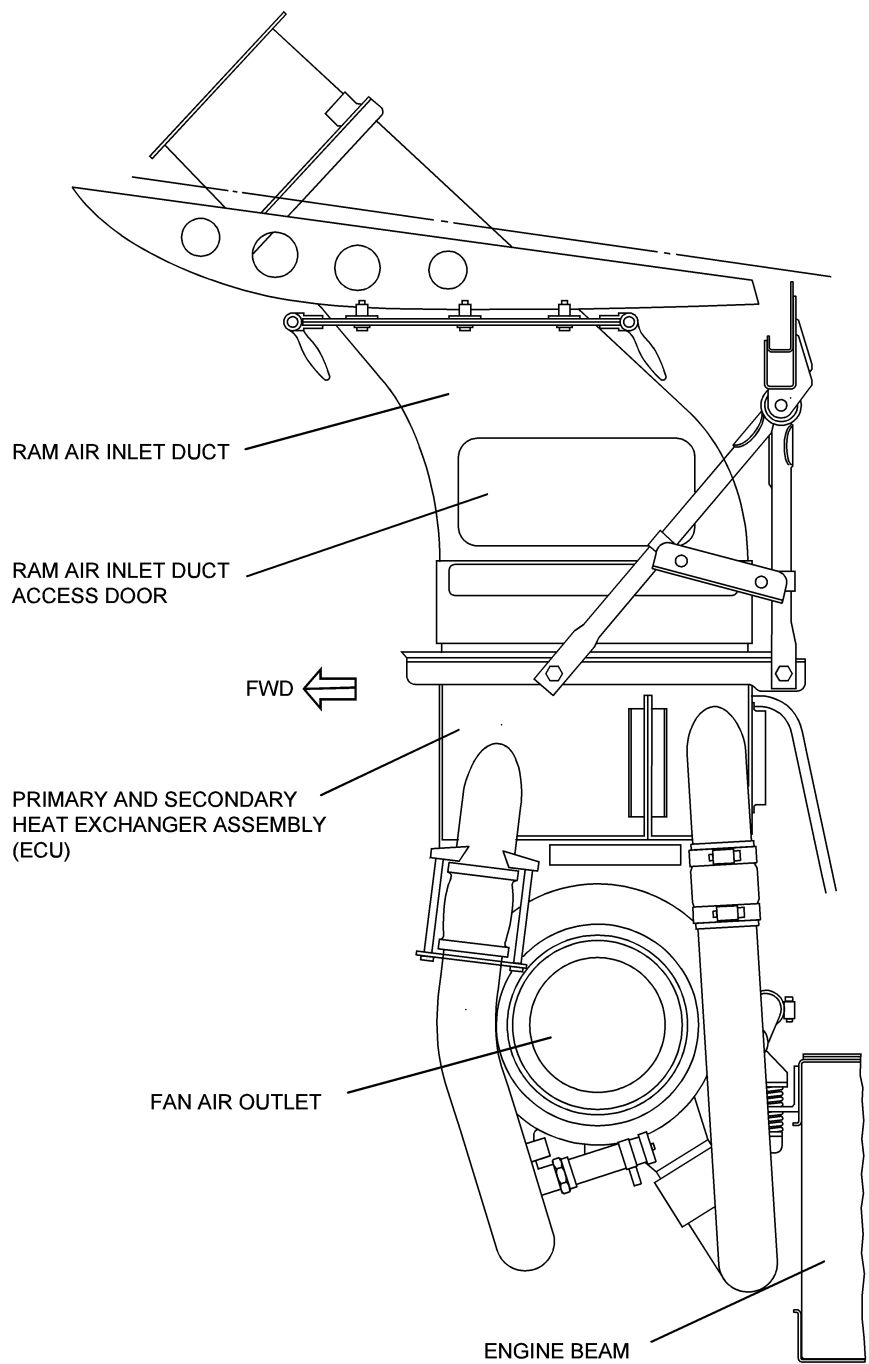


HA21B035836AA.TIF

Figure 207 (Sheet 1 of 2)
ECU Cleaning

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



HA21B035837AA.AI

Figure 207 (Sheet 2 of 2)
ECU Cleaning

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

B. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

4. ACM STATIC BREAKAWAY TORQUE CHECK

A. Procedure

- (1) Make sure the airplane busbars are de-energized (Ref. 24-01-00, 201).
- (2) Get access to the ACM fan wheel by loosening the securing clamps and disconnecting the exhaust (fan) outlet ducting (Ref. Figure 201).

CAUTION: Rotor static breakaway torque shall not exceed 80 ounce inches. If measurements in excess of this figure are obtained, then the ACM must be replaced.

- (3) Using a torque wrench, a 3/8 inch drive extension and a 3/8 inch deep 12 point socket, apply a counterclockwise rotational force to the fan wheel retaining nut until breakaway motion is achieved within the specified figure quoted above.
- (4) Reconnect the exhaust (fan) outlet ducting. Tighten the securing clamps and torque load to 25 to 30 lb in. (2.82 to 3.39 Nm).
- (5) Energize airplane busbars as necessary (Ref. 24-01-00, 201).

B. Close Up

	MECH	INSP
(1) Make sure that the work area is clean and clear of tools and other equipment.		

WATER SEPARATOR - DESCRIPTION AND OPERATION

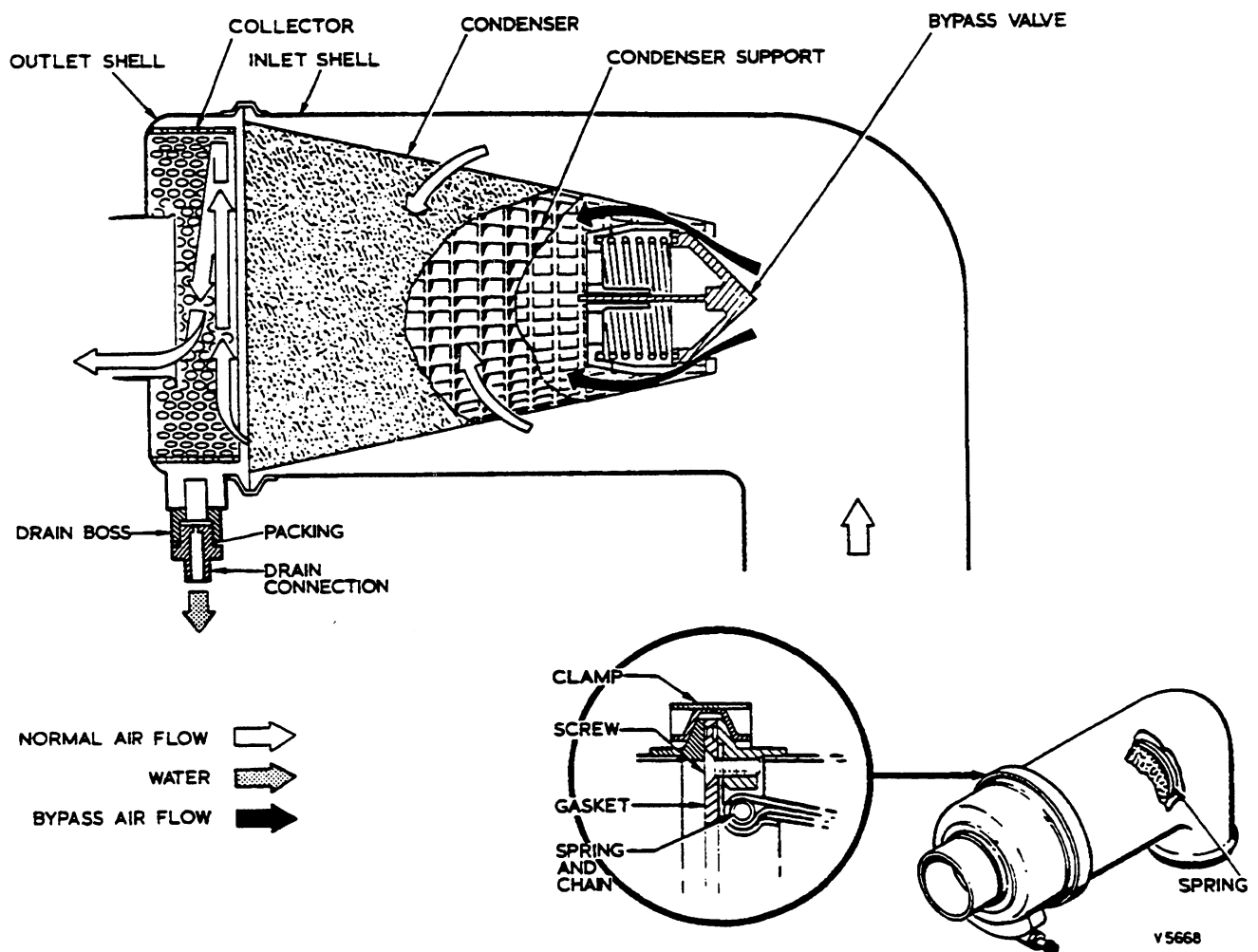
1. Description

The water separator consists of a condenser assembly inside an inlet shell and a collector inside an outlet shell.

The condenser assembly consists of a bypass valve, a conical condenser support, and a glass fibre condenser. Closely spaced vanes of the condenser support allows water to pass through to the inside of the condenser. The spring-loaded, normally closed bypass valve is mounted in the inlet end of the condenser support.

The collector is a perforated cylindrical shell that divides the outlet shell into inner and outer chambers. An outlet duct on the outlet shell extends into the inner chamber. A drain boss is provided on the bottom of the outlet shell.

A drain pipe connection screws into the drain boss to provide a means of draining condensed water from the separator.



Water separator
Figure 1

EFFECTIVITY:

800XP

21-10-95

Page 1

July 95

2. Operation

The separator removes water particles from air by combining small water particles to increase the size of the particles, then separating the larger, heavier particles from the air by centrifugal force.

Small water particles in the air are formed into larger particles in flowing through the condenser. As the air passes through the vanes of the support, the water particles are carried with the swirling air and are thrown outward against the walls of the collector. The quiescent chamber between the collector and outlet shell permits the water entering the chamber to drain down the walls of the outlet shell to the bottom of the separator. The collected water then passes through the drain connection while the air is discharged through the air outlet of the separator.

If foreign material clogs the condenser, airflow through the separator is retarded and causes an increase in pressure differential across the bypass valve. When the pressure differential exceeds the force of the bypass valve spring, the valve opens and air passes through the valve without passing through the condenser. This bypassing of air makes sure a constant flow of air to the cabin of the aircraft.

WATER SEPARATOR - TROUBLE SHOOTING

Trouble	Probable Cause	Remedy
High cabin air humidity	Associated drainage equipment defective	Correct defect
	Condenser defective	Replace condenser
	Separator defective	Replace separator
Loss of cabin air pressure traced to separator	Gasket defective	Replace gasket
	Separator defective	Replace separator
Excessive noise from cabin air conditioning input system traced to separator	Separator by-pass valve damping unstable	Replace by-pass valve damper packings

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION WATER SEPARATOR REMOVAL/INSTALLATION

1. INFORMATION

Equipment/Materials	Part/Item No.
Torque wrench 25 to 75 lb.in. (2.82 to 8.47 Nm)	Local supply

2. WATER SEPARATOR

A. Removal

	MECH	INSP
(1) Loosen the hose clip and disconnect flexible pipeline from the separator drain connection (Ref. Figure 401).		
(2) Loosen the clamps and disconnect sleeves from the separator.		
(3) Undo the strap securing the separator to its mounting and remove the separator.		
(4) Install blanks to separator and open ducts.		

B. Installation

	MECH	INSP
(1) Remove blanks.		
(2) With the bonding jumper in position, connect the sleeve to the separator inlet with the clamp. Make sure the sleeve is equalized over the joint and that engagement with the ducts is 1.3 in. (33 mm) minimum.		
(3) Slacken the clamp which secures the outlet shell, rotate the outlet shell until the drain is in the lowest possible position with separator body horizontal, as shown on Figure 401. Tighten clamp and torque-load to 50 ± 5 lb.in. (5.65 ± 0.56 Nm).		
(4) With the bonding jumper in position, connect the sleeve to the separator outlet with the clamp.		
(5) Install dumbbell tape to the separator securing strap, position the strap around the separator and tighten. Torque-load strap to 25 ± 5 lb.in. (2.82 ± 0.56 Nm).		
(6) Connect the flexible pipe to the separator drain connection with the hose clip.		
(7) Do a leak test (Ref. 21-10-95, 501).		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

C. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

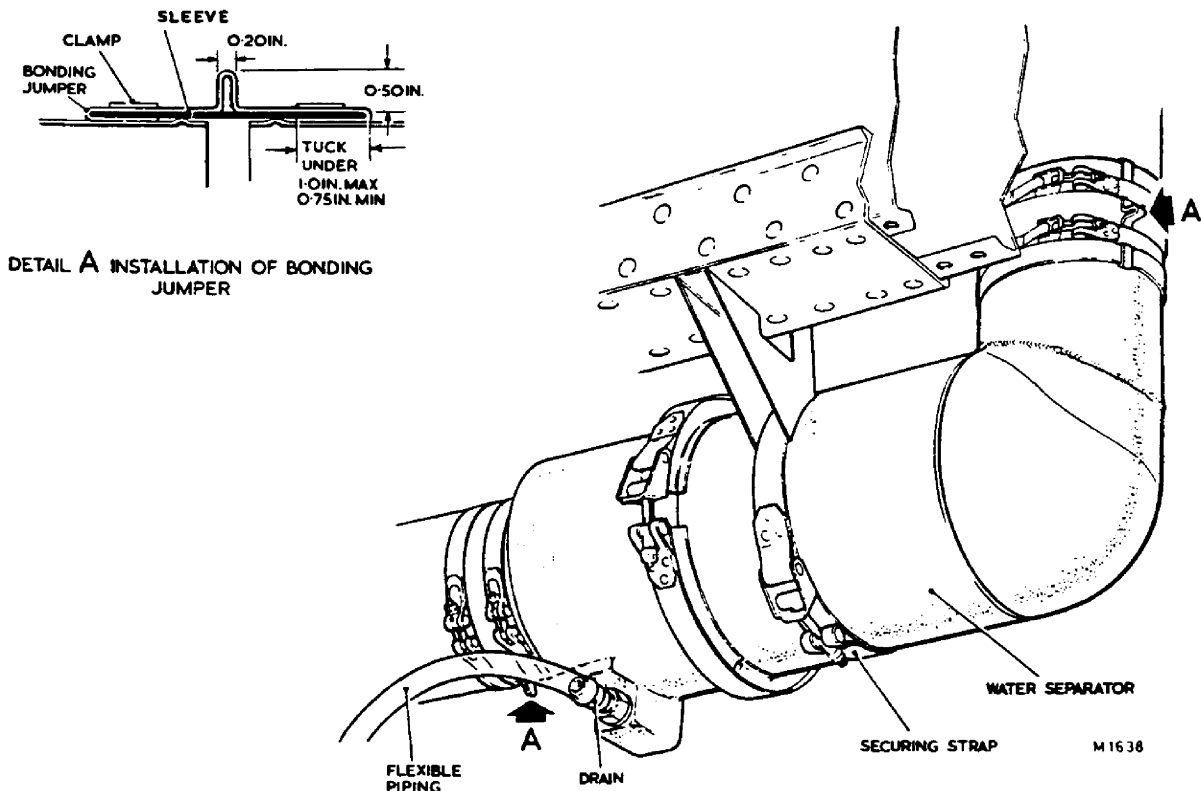


Figure 401
Water Separator Installation

3. SEPARATOR CONDENSER AND GASKET

A. Removal

CAUTION: The condenser is constructed of glass fiber and must be handled with care to prevent distortion taking place.

	MECH	INSP
(1) Remove the separator (Ref. Figure 402).		
(2) Remove the clamp and separate the inlet shell from the outlet shell.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(3) Remove the screws and lift the gasket and condenser assembly from inlet shell.		
(4) Remove the spring and chain and remove the condenser assembly from the condenser support.		

B. Installation

	MECH	INSP
(1) Feed the spring and chain through the pocket in the large end of the condenser.		
(2) Install the condenser on the condenser support and hook the free end of the chain on the free end of the spring.		
(3) Install the spring on the small end of the condenser so that the spring rests in the recess in the condenser support.		
(4) Position the condenser assembly in the inlet shell and fit the gasket and screws.		
(5) Mate the inlet shell to the outlet shell and fit the securing clamp.		
(6) Install the separator.		
(7) Do a leak test (Ref. 21-10-95, 501).		

C. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

4. SEPARATOR BY-PASS VALVE

A. Removal

	MECH	INSP
(1) Remove the separator (Ref. Figure 402).		
(2) Remove the clamp and remove the inlet shell from the outlet shell.		
(3) Remove the screws and lift the gasket and condenser assembly from the inlet shell.		
(4) Remove the screws and washers which connect the by-pass valve to the condenser assembly, and remove the valve.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

B. Installation

	MECH	INSP
(1) Position the by-pass valve and install the screws and washers, wire-lock the screws.		
(2) Position the condenser assembly in the inlet shell and install the gasket and the screws.		
(3) Mate the inlet shell to the outlet shell and install attachment clamp.		
(4) Install the separator.		
(5) Do a leak test (Ref. 21-10-95, 501).		

C. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

5. SCREEN ASSEMBLY

A. Removal

	MECH	INSP
(1) Remove the water drain pipe from the plug assembly (Ref. Figure 402).		
(2) Remove the plug assembly and O-ring seal from the water separator.		
(3) Remove the screen assembly (if installed) from the water drain outlet.		

B. Installation

	MECH	INSP
(1) Install the screen assembly (if installed) into the water drain outlet.		
(2) Install the plug assembly with a new O-ring seal.		
(3) Connect the water drain pipe to the plug assembly.		

C. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

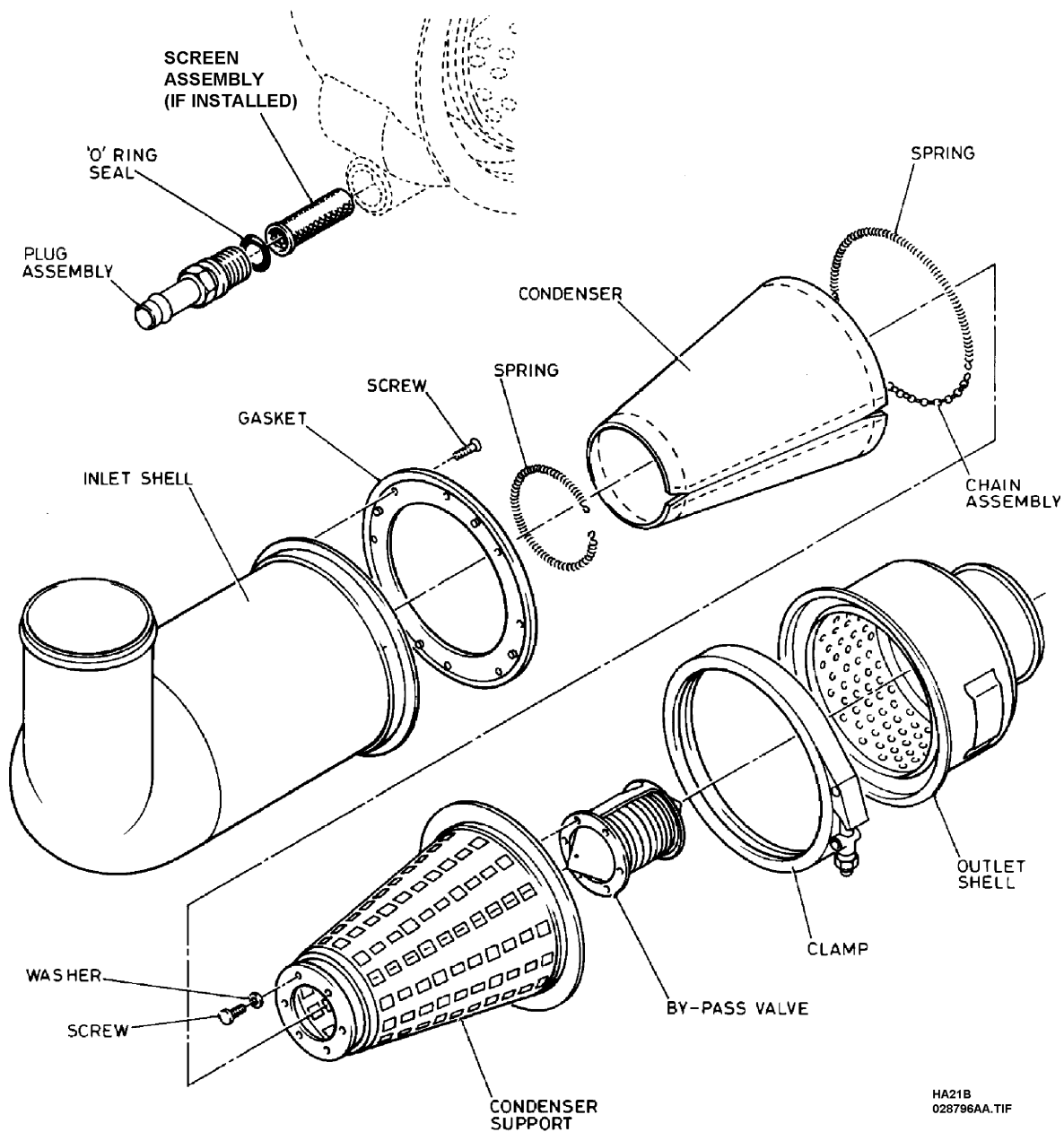


Figure 402
Water Separator Disassembly

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION WATER SEPARATOR ADJUSTMENT/TEST

1. WATER SEPARATOR

A. Leak Test After Water Separator Installation

WARNING: Air leaks from the joints in the ducting will be at a high temperature. Be careful when you examine joints for leaks by hand.

- (1) Do a test of the air conditioning system to do a leak check at the disturbed joints (Ref. 21-10-15, 201).

B. Close Up

- (1) Make sure the work area is clean and clear of tools and other equipment.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION WATER SEPARATOR INSPECTION/CHECK

1. INFORMATION

A. Equipment/Materials

Equipment/Material	Part/Item No.
Torque wrench 25 to 30 lbf in. (2.8 to 3.4 Nm)	Local supply

2. INSPECTION/CHECK

A. Do a Check of the Water Separator Condenser

- (1) Remove the condenser assembly from the water separator (Ref. 21-10-95, 401).
- (2) Examine the condenser and make sure it is clean and undamaged (Ref. Figure 601).
- (3) Install the serviceable condenser assembly to the water separator (Ref. 21-10-95, 401).
- (4) Make sure that the work area is clean and clear of tools and other equipment.
- (5) Do a test of the water separator (Ref. 21-10-95, 501).

B. Do a Check of the Water Separator By-pass Valve

- (1) Remove the water separator by-pass valve (Ref. 21-10-95, 401).
- (2) Examine the valve for cleanliness and operation (Ref. Figure 601).
- (3) Open the by-pass valve by compression of the spring by hand. Make sure that the by-pass valve moves smoothly over its full range of damped movement back to its closed position.
- (4) If the by-pass valve damping action is unsatisfactory refer to (Ref. 21-10-95, 801) and replace the damper packings.
- (5) Do paragraph 1.B. (3) again. If the by-pass valve stays unserviceable replace the valve assembly (AiResearch Part No. 171019-5).
- (6) Install the serviceable water separator by-pass valve (Ref. 21-10-95, 401).
- (7) Make sure that the working area is clean and clear of all tools and miscellaneous equipment.
- (8) Do a test of the water separator (Ref. 21-10-95, 501).

C. Water Separator Water Drain

- (1) At the water drain connection of the water separator, found at the lowest position on the water separator, loosen the hose clip and disconnect the flexible pipeline (Ref. Figure 602).

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (2) At the water drain, loosen and remove the plug assembly and O-ring. Make sure that the plug assembly is clean and clear of obstructions.
- (3) On airplanes with a water drain screen installed:
 - (a) Remove the screen assembly.
 - (b) Examine the screen assembly for damage and contamination. Clean as necessary, and/or replace if damaged (AiResearch Part No. 175058).
 - (c) Install the screen assembly.
- (4) On all airplanes:
Install a new O-ring. Install and tighten the plug assembly.
- (5) Install the flexible pipeline to the drain connection of the water separator and secure with the hose clip. Torque tighten the hose clip to between 25 and 30 lbf in. (2.8 and 3.4 Nm).
- (6) Make sure that the work area is clean and clear of all tools and other equipment.
- (7) Do a test of the water separator (Ref. 21-10-95, 501).

D. Do a Check of the Water Separator Water Drain Pipeline

- (1) At the water drain connection of the water separator, found at the lowest position on the water separator, loosen the hose clip and disconnect the flexible pipeline (Ref. Figure 603).
- (2) At the water injector nozzle on the ram air intake duct, disconnect the water drain pipeline.
- (3) Use a dry air supply to blow through the pipe, make sure that the water drain pipeline is clear of obstruction.
- (4) Connect the pipeline disconnected at paragraphs 1.D. (1) and (2).
- (5) Make sure that the work area is clean and clear of all tools and other equipment.

E. Do a Check of the HP Line to the Water Injector Nozzle

- (1) Disconnect the HP pipeline at the water injector nozzle (found on the ram air duct), also disconnect the other end of the pipe at the connection to the heat exchanger (Ref. Figure 603).
- (2) Use a dry air supply to blow through the pipe, make sure that the pipeline is clear of obstruction.
- (3) Disconnect and remove the water injector nozzle.
- (4) Use a dry air supply to blow through the nozzle, make sure that the nozzle is clear of obstruction.
- (5) Install the water nozzle removed at paragraph 1.E. (3).
- (6) Install the pipeline disconnected at paragraph 1.E. (1).
- (7) Make sure that the working area is clean and clear of all tools and miscellaneous equipment.
- (8) Do a test of the water separator, (Ref. 21-10-95, 501). Make sure that all connections to pipes disturbed during this check are free from leaks.

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



21-10-95

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

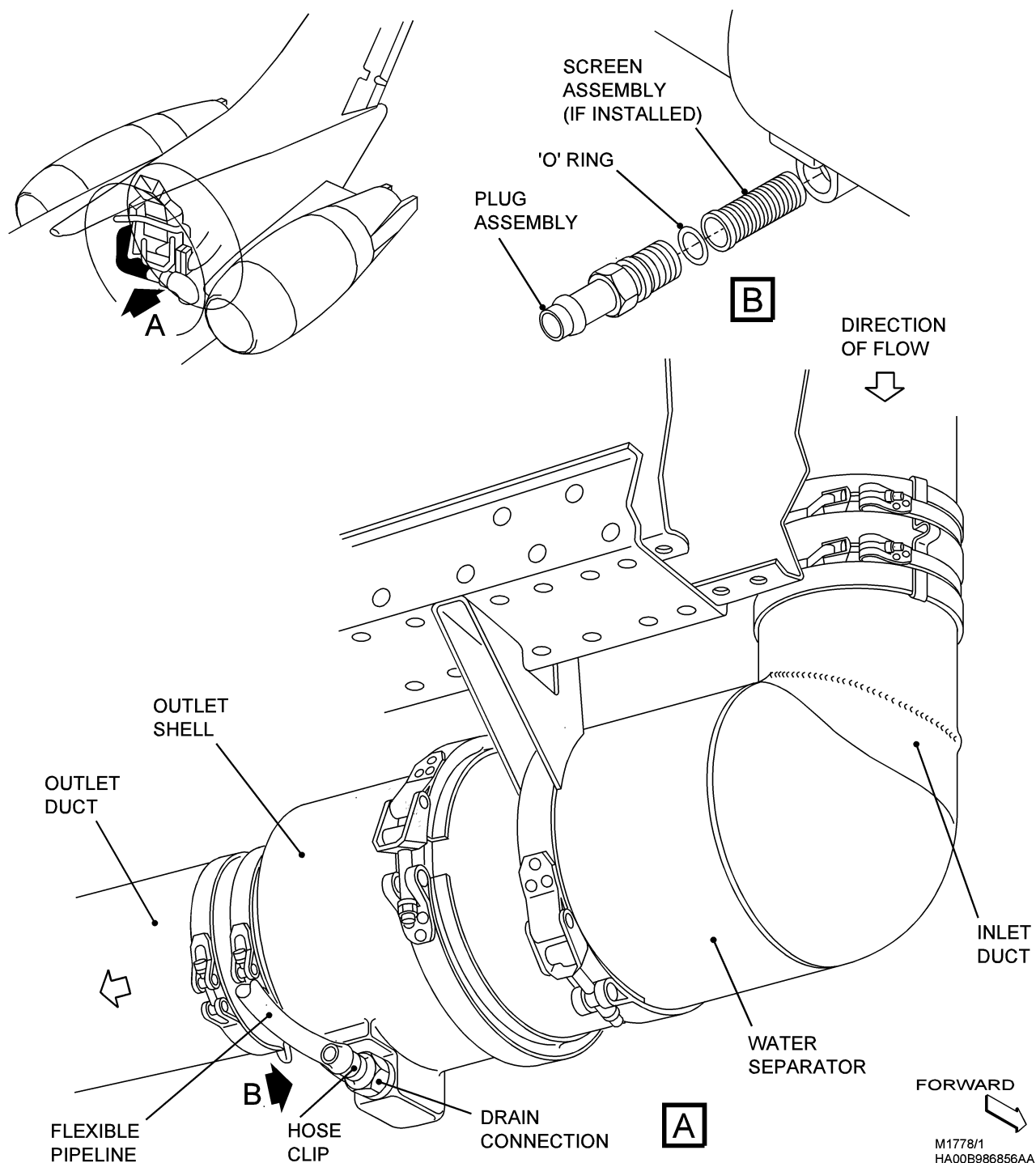
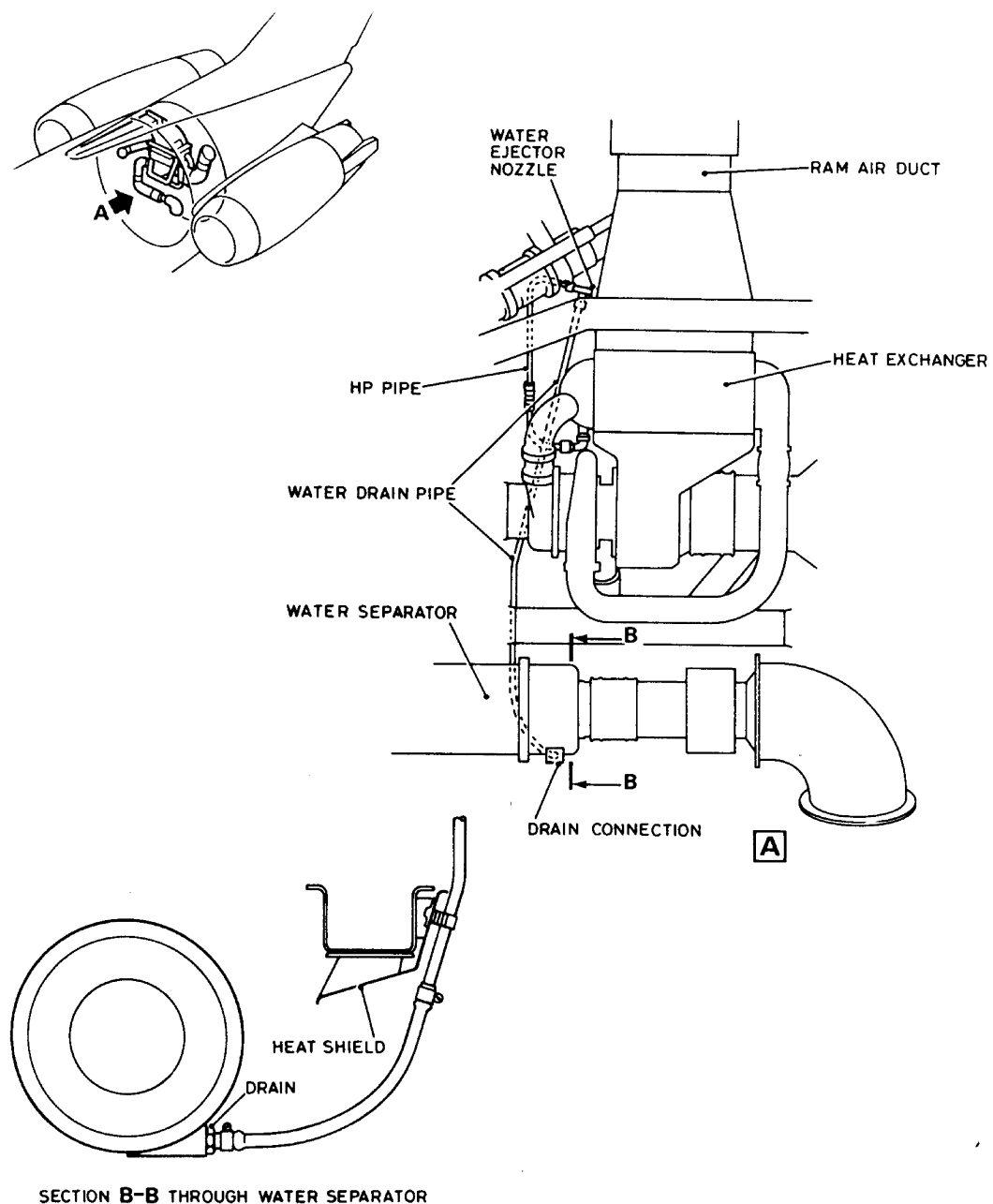


Figure 602
Water Separator – Water Drain

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



M1779

Figure 603
Water Separator – Water Injector Pipelines

21-10-95

Page 605
Sep.06

WATER SEPARATOR - CLEANING/PAINTING

1. Condenser

Equipment/Materials	Part/Item No.
Mild solution of liquid detergent	Local supply

A. Clean the condenser

- (1) Remove the water separator (REMOVAL/INSTALLATION).
- (2) Dismantle the water separator (REMOVAL/INSTALLATION).
- (3) Remove the condenser from the support assembly (REMOVAL/INSTALLATION).
- (4) Clean the condenser in a mild solution of liquid detergent.
- (5) Make sure the condenser is thoroughly dried.
- (6) Assemble the condenser to the support assembly (REMOVAL/INSTALLATION).
- (7) Assemble the water separator (REMOVAL/INSTALLATION).
- (8) Install the water separator (REMOVAL/INSTALLATION).

2. Screen assembly

Equipment/Materials	Part/Item No.
Cleaning solvent	230 (Chapter 20-95-201)

A. Clean the screen assembly

- (1) Remove the screen assembly (REMOVAL/INSTALLATION).
- (2) Clean the screen assembly with cleaning solvent (item 230).
- (3) Make sure the screen assembly is thoroughly dried.
- (4) Assemble the screen assembly in to the water separator (REMOVAL/INSTALLATION).

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION WATER SEPARATOR REPAIRS

1. INFORMATION

Equipment/Materials	Part/Item No.
Packings (O-rings) (3)	AN6227/6 (AiResearch) or MS 28775-11
Petrolatum, Lubricant	091 (Chapter 20-95-091)

2. SEPARATOR BY-PASS VALVE

A. Renew Damper Packings

- (1) Remove the separator (Ref. 21-10-95, 401).
- (2) Dismantle the separator (Ref. 21-10-95, 401).
- (3) Remove the by-pass valve (Ref. 21-10-95, 401).
- (4) Disassemble the separator by-pass valve (Ref. Figure 801):
 - (a) Remove the three screws which secure the packing retainer to the valve assembly.

NOTE: Access to the screws retaining nuts is gained by compressing the valve spring towards the valve shut position.
 - (b) Slide the packings retainer from the valve shaft assembly.
 - (c) Carefully remove the packings without damaging the packings retaining grooves.
- (5) Assemble the separator by-pass valve (Ref. Figure 801):
 - (a) Carefully insert new packings into their retaining grooves making sure that the groove edges are not damaged during packing insertion.

NOTE: A light smear of lubricant (Item 091) on the periphery of each packing will assist installation.
 - (b) Slide the retainer on to the valve shaft assembly and align the securing screw holes. Install the screws, washers, self-locking nuts and tighten.
- (6) Install the separator by-pass valve (Ref. 21-10-95, 401).
- (7) Assemble the separator (Ref. 21-10-95, 401).
- (8) Install the separator (Ref. 21-10-95, 401).
- (9) Do a leak test (Ref. 21-10-95, 501).

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

B. Close Up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

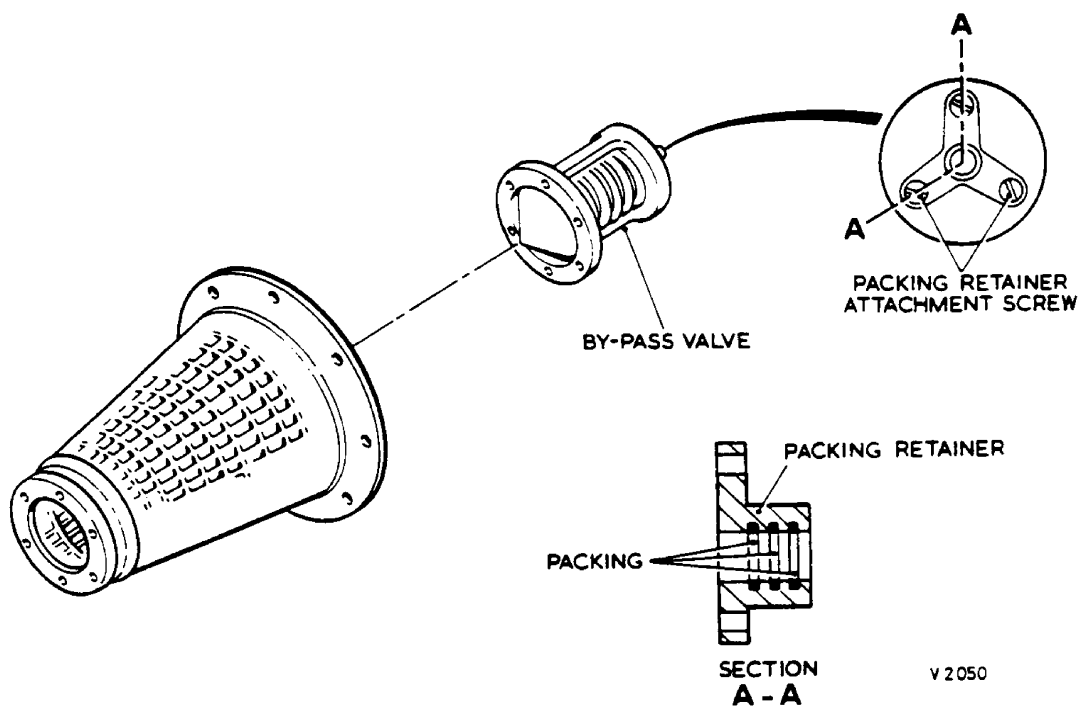


Figure 801
Water separator by-pass valve

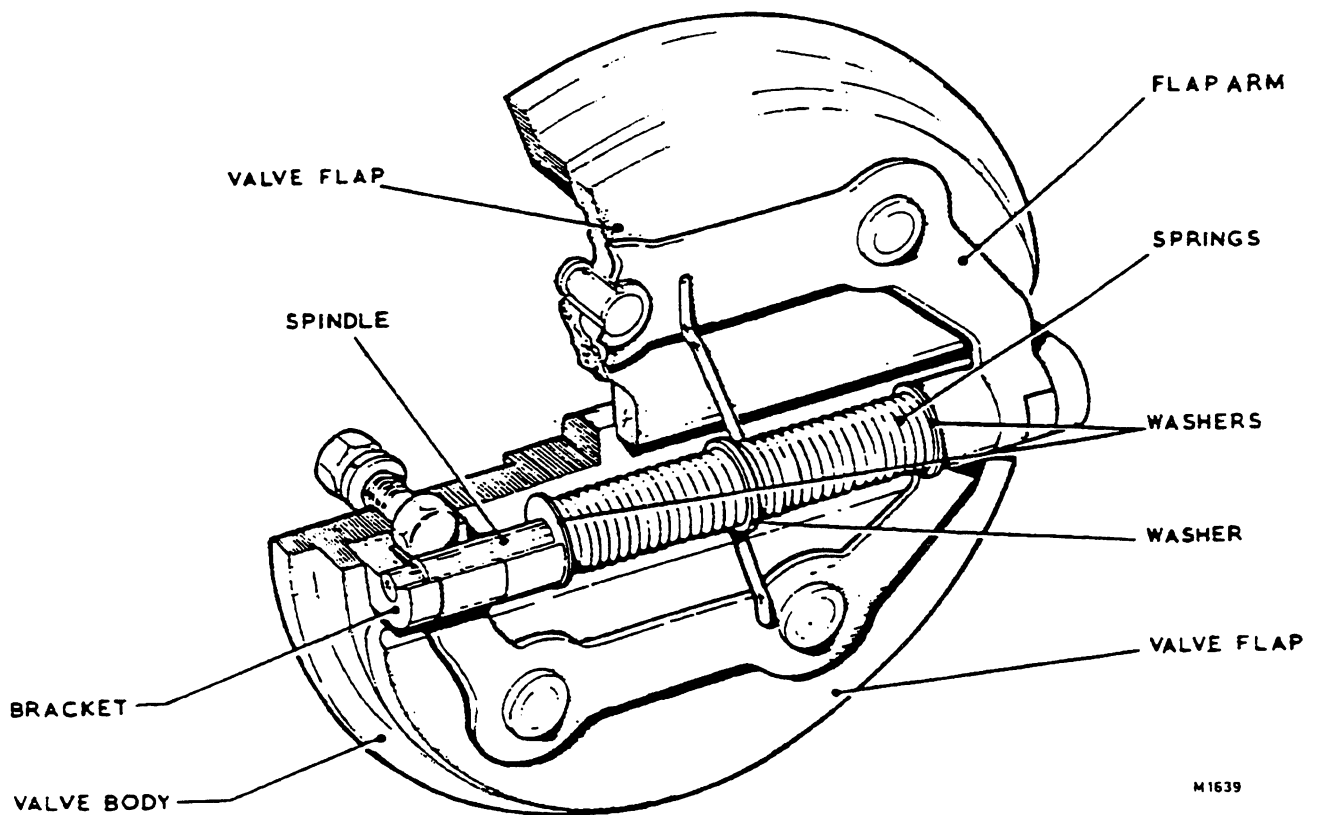
NON-RETURN VALVE (MAIN SUPPLY) - DESCRIPTION AND OPERATIONS

1. Description

The non-return valve consists essentially of a valve body incorporating two valve apertures which are separated by a cross member to which two spring-loaded flap and arm assemblies are attached. The valve flaps each have an angular movement of approximately 90° and are secured to the flap arms which are carried on a spindle. The spindle is supported by two brackets fitted to the cross member. Two springs are located between the flap arms and these load the flaps in the closed position and provide a damping effect on the movement of the valve flap.

2. Operation

The valve functions by opening to permit the supply of air when a small pressure differential exists, and to shut under spring action when differential pressure ceases, thus preventing airflow in the reverse direction.



Non-return valve
Figure 1

EFFECTIVITY:

800XP

21-10-107

Page 1

July 95

NON-RETURN VALVE (MAIN SUPPLY) - MAINTENANCE PRACTICES

1. Procedure

Equipment/Material	Part/Item No.
White spirit	219 (Chapter 20-95-201)

A. Removal

- (1) Get access to the cabin side of the rear pressure bulkhead.
- (2) Remove the two-way valve.
- (3) At the rear of the pressure bulkhead, remove the bolts which secure the coupling flange to the pressure-sealing cone.
- (4) Remove the coupling flange from the sealing cone and remove the non-return valve.
- (5) Blank off the pressure-sealing cone.

B. Cleaning

WARNING: DO NOT USE THE CLEANING FLUID NEAR FLAMES. USE THE CLEANING FLUID IN AN AREA WHICH HAS GOOD VENTILATION AND DO NOT BREATHE THE FUMES.

- (1) Clean the valve with white spirit (item 219).
- (2) Use a lint-free cloth and make sure the valve is clean and dry.

C. Inspection/Check

- (1) Make sure the valve has no visible damage.
- (2) Make sure the valve is clean, especially between the flappers and the valve body.
- (3) Make sure the valve components have no corrosion and the surface finish is good.
- (4) Make sure the flappers have no distortion.
- (5) Make sure the flapper hinge pin and holes do not have excessive wear.
- (6) Make sure the flappers are securely riveted to the flap arms.
- (7) Open the flappers against the springs and close them gently. Make sure the flappers are held closed with the spring and have good contact with the valve body.

D. Installation

- (1) Remove the blank from pressure-sealing cone.
- (2) Position the non-return valve so that the hinge axis is vertical. Insert the coupling flange into the pressure-sealing cone and secure with the bolts, Wire-lock the bolts.

EFFECTIVITY:



HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (3) Install the two-way valve.
- (4) Install any equipment removed during paragraph 1.A.(1).

E. Functional test

- (1) Do a functional test of the air conditioning system (Chapter 21, PRESSURIZATION CONTROL).

F. Job close up

- (1) Remove all the tools, the materials and the equipment. Make sure the work area is clean.

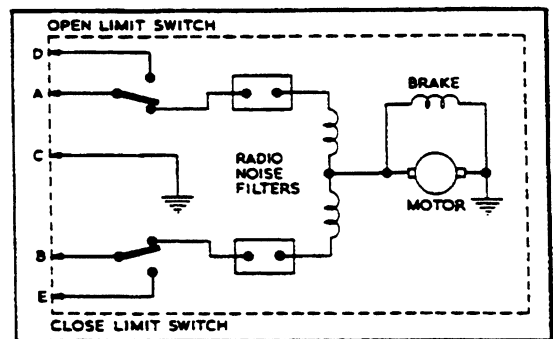
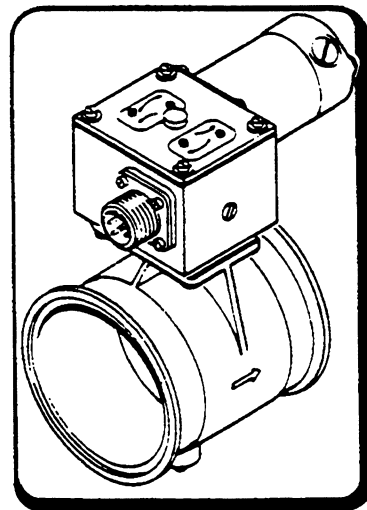
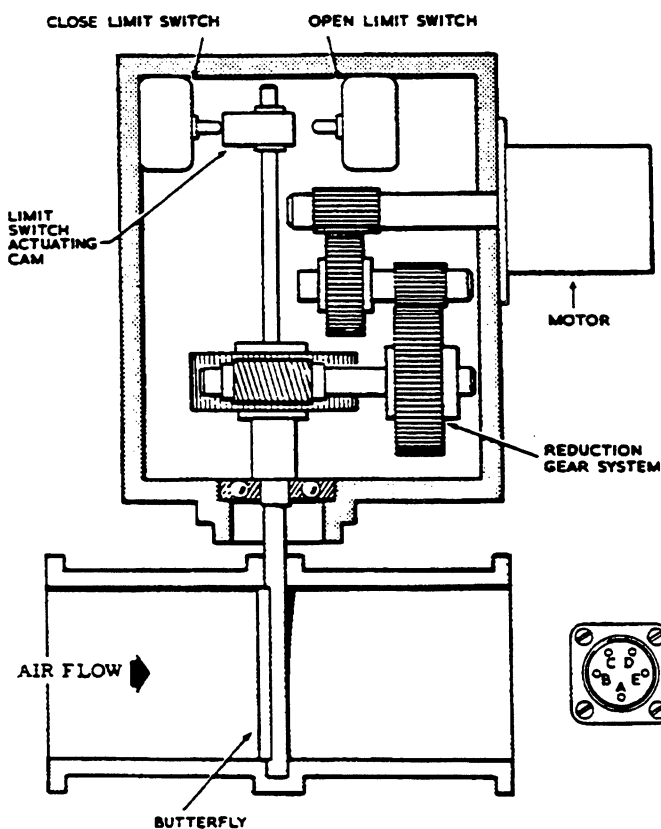
RAM AIR VALVE - DESCRIPTION AND OPERATION

1. Description

The electric shut-off butterfly valve consists of an electro-mechanical rotary actuator and a butterfly valve assembly. The actuator is mounted on the valve assembly.

The actuator contains an electric motor which is equipped with a magnetic brake, a gear train, limit switches and an output shaft. The splined end of the motor shaft extends into the gear case to actuate the gear train, output shaft, and limit switch actuating cams.

The valve assembly is made up of a valve body, which serves as an airflow duct and a butterfly assembly. The butterfly assembly consists of a butterfly clamped between two plates. One plate has an integral shaft section which engages the actuator output shaft. The other plate has an integral shaft section which supports the butterfly assembly and positions it within the body.



M1640

Ram air valve
Figure 1

EFFECTIVITY:

800XP

21-10-155

Page 1

July 95

2. Operation

This unit is controlled by an external electrical circuit. When pins A and C are energized, the butterfly will move to full-open position. When pins B and C are energized, the butterfly will move to full-closed position. (wiring diagram, *Figure 1*). When the butterfly is full-open or full-closed, the appropriate limit switch is mechanically tripped, opening the motor circuit and stopping actuator travel. When the butterfly is fully open, circuit A-D is closed by the open limit switch; when the butterfly is fully closed, circuit 5-E is closed. These circuits can be utilized to operate remote equipment. The limit switches are adjustable so that the butterfly travel may be limited in either direction.

Should the motor circuit be de-energized before one of the limit switches is tripped, the magnetic brake, in conjunction with the gear train, will hold the butterfly at the selected position.

3. Data

Operating Air Pressure	81 psig (Max)
Operating Air Temperature	93°C (200°F) (Max)
Operating Time	7 to 13 Sec at 4.4° to 49°C (40° to 120°F)
Ambient Air Temperature Range	-54° to 107°C (-65° to 225°F)
Actuator	
Receptacle	AN3102A-145-5P
Pin A	Energize to open butterfly
Pin B	Energize to close butterfly
Pin C	Earth
Pin D	Energized when butterfly is fully open
Pin E	Energized when butterfly is fully closed
Operating Current	1.2 Amp at 26 volts d.c. (Max) at 4.4° to 49°C (40° to 120°F)
Duty Cycle	Operating Time 15 Sec on - 45 Sec off with ambient Temp. of - 54° to 65°C (-65° to 150°F) 15 Sec on. 2 Min off with ambient Temp. of 65° to 107°C (150° to 225°F)

RAM AIR VALVE - TROUBLE SHOOTING

Fault	Probable Cause	Remedy
Leakage at ducting connection	Connections loose or defective	Tighten connections or replace defective component
Erratic or sluggish operation	Dump valve microswitch requires adjustment or is defective	Adjust or replace microswitch
	Electrical connection loose or defective	Tighten connection or replace defective component
	Butterfly is not free	Replace unit
Unit operates in only one direction	Dump valve microswitch requires adjustment or is defective	Adjust or replace microswitch
	Actuator defective	Replace unit
Unit inoperative	Dump valve microswitch requires adjustment or is defective	Adjust or replace microswitch
	Electrical connection loose or defective	Tighten connection or replace defective component
	Actuator defective	Replace unit
	Butterfly is not free in housing	Replace unit

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION RAM AIR VALVE MAINTENANCE PRACTICES

1. INFORMATION

Equipment/Materials	Part/Item No.
Torque Wrench capable of 40-50 lbf.in. (4.52-5.65 Nm)	Local supply

2. RAM AIR VALVE

A. Removal

	MECH	INSP
(1) At panel DA/D, open the ram air valve circuit breaker (Ref. 24-01-00, 201).		
(2) Disconnect electrical connector from the valve.		
(3) Release clamps that hold the valve to the stub pipe bracket assemblies; remove the valve and seals.		
(4) Install blanks to valve, duct and duct adapter, or stub pipe bracket assemblies.		

B. Installation

	MECH	INSP
(1) Remove the blanks.		
(2) Position valve so that arrow on valve body indicates direction of airflow, install serviceable seals, and attach valve to stub pipe bracket assemblies with the clamps; torque-load clamp-bolt nuts to 40-50 lbf.in. (4.52-5.65 Nm).		
(3) Connect the electrical connector to the valve.		
(4) Close the circuit breaker opened during removal.		

C. Checks/Tests after Installation

- (1) Energize d.c. busbar (Ref. 24-01-00, 201).

CAUTION: Due to the danger of overheating, valve operation must be limited to a maximum duration of 15 seconds followed by a rest period of 45 seconds (ambient temperature not exceeding (150°F. 65°C) or rest period of 2 minutes (ambient temperature exceeding 150°F. 65°C).

- (2) Operate DUMP VALVE lever to OPEN, listen and make sure the motor runs for 13 seconds.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

(3) After a suitable period operate DUMP VALVE lever to SHUT, listen and make sure the motor runs for 13 seconds.

(4) De-energize busbars (Ref. 24-01-00, 201).

D. Close Up

(1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

NON-RETURN VALVE (RAM AIR SUPPLY) - DESCRIPTION AND OPERATION

1. Description

The non-return valve consists of a valve body containing two semi-circular flappers hinged about a pin running through the centre of the valve body. The valve is located normal to the airflow axis in a circular air duct.

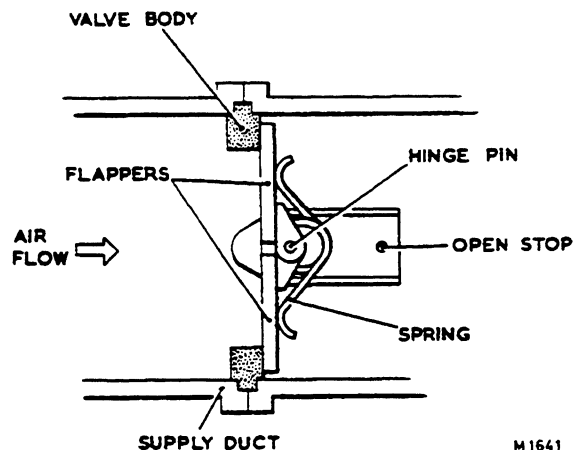
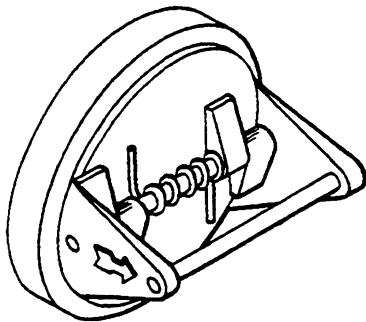
2. Operation

Air pressure on the upstream side of the check valve acts upon the surface of the flappers. The flappers move towards the open position allowing normal airflow.

If the airflow is reversed, the flappers close. Airflow is halted until the upstream-to-downstream air pressure differential is sufficient to re-open the flappers.

3. Data

Operating air pressure (normal flow)	20 psi (max.)
Operating air pressure (reverse flow)	9 psi (max.)
Operating air temperature	204° C (400° F) (max.) Std. air density.



Non-return valve
Figure 1

NON-RETURN VALVE (RAM AIR SUPPLY) - TROUBLE SHOOTING

Fault	Probable Cause	Remedy
Airflow erratic	Flappers are not free, hinge pin distorted	Replace valve
	External leakage of valve	Replace duct O-ring
	Loose or defective duct connections	Tighten connections or replace defective components
Valve fails to check	Obstructions in air duct	Remove obstruction
	Flapper or pin damaged	Replace valve

NON-RETURN VALVE (RAM AIR SUPPLY) - MAINTENANCE PRACTICES

1. Removal/Installation

Equipment/Material	Part/Item No.
White spirit	219 (Chapter 20-95-201)

A. Removal

- (1) Get access to the cabin side of the rear pressure bulkhead.
- (2) Slacken the hose clip and disconnect the flexible pipeline from the ram air coupling at the pressure dome.
- (3) With an operator positioned at the rear of the pressure bulkhead to retain the nuts and washers, remove the bolts which secure the ram air coupling. Remove the coupling, valve retainer, non-return valve and gasket.
- (4) Install blanks to the flexible pipeline and the open duct.

B. Cleaning

WARNING: DO NOT USE THE CLEANING FLUID NEAR FLAMES. USE THE CLEANING FLUID IN AN AREA WHICH HAS GOOD VENTILATION AND DO NOT BREATHE THE FUMES.

- (1) Clean the valve with white spirit (item 219).
- (2) Use a lint-free cloth and make sure the valve is clean and dry.

C. Inspection/Check

- (1) Make sure the valve has no visible damage.
- (2) Make sure the valve is clean, especially between the flappers and the valve body.
- (3) Make sure the valve components have no corrosion and the surface finish is good.
- (4) Make sure the flappers have no distortion.
- (5) Make sure the flapper hinge pin and holes do not have excessive wear. Make sure the axial and radial play is not more than 0.025 in.
- (6) Open the flappers against the springs and close them gently. Make sure the flappers are held closed with the spring and have good contact with the valve body.

D. Installation

- (1) Remove the blanks.
- (2) Position the gasket, non-return valve, valve retainer and the ram air coupling on the pressure bulkhead. Insert the securing bolts through the assembly, pressure bulkhead, elbow assembly and equipment bay ventilation stub (bottom three bolts only), and secure using washers and nuts.

EFFECTIVITY:



HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (3) Install the flexible pipeline to the ram air coupling and secure with the hose clip.
- (4) Install any equipment removed during paragraph 1.A. (1).

E. Functional test

- (1) Do a functional test of the air conditioning system (Chapter 21, PRESSURIZATION CONTROL).

F. Job close up

- (1) Remove all the tools, the materials and the equipment. Make sure the work area is clean.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING DISTRIBUTION SHUT-OFF VALVE (APU SUPPLY) MAINTENANCE MANUAL

1. INFORMATION

A. Equipment/Materials

Equipment/Materials	Part/Item No.
Torque spanner capable of 40-50 lbf.in. (4.52-5.65 Nm)	Local supply

2. REMOVAL/INSTALLATION

A. Removal

	MECH	INSP
(1) On panel DA, open the APU air valve circuit breaker (Ref. 24-01-00, 201).		
(2) Disconnect electrical connector from the valve.		
(3) Loosen the clamps that attach the valve to the ducts, remove valve and seals.		
(4) Install blanks to all ducts.		

B. Installation

	MECH	INSP
(1) Remove blanks from ducts.		
(2) Position valve so that arrow on the valve body indicates direction of airflow, install serviceable seals, and attach valve to duct assemblies using clamps. Torque load clamp bolt nuts to 40-50 lb in. (4.52-5.65 Nm).		
(3) Connect the electrical connector to the valve.		
(4) Close circuit breaker opened during removal.		

C. Checks/Tests After Installation

- (1) Start auxiliary power unit (Ref. 49-16-00, 501).

CAUTION: Due to the danger of overheating, valve operation must be limited to a maximum duration of one minute followed by a rest period of four minutes.

- (2) Select APU AIR switch to OPEN, and check that the valve motors to the fully open position in 10 to 14 seconds.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

I

WARNING: Air leaks from joints in the ducting will be at a high temperature. Be careful when you examine joints for leaks by hand.

- (3) Examine the valve joints, by touch, for leaks.
- (4) Select APU AIR switch to CLOSE, and make sure the valve moves to the fully closed position.
- (5) Shut down auxiliary power unit (Ref. 49-16-00, 501).

D. Close Up

	MECH	INSP
(1) Make sure that the work area is clean and clear of tools and other equipment.		

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

BAGGAGE PANNIER HEATING - DESCRIPTION AND OPERATION

1. Description *(Figure 1 and Figure 2)*

Two shut-off valves are installed to control a heating supply to the baggage pannier, and are electrically interconnected to prevent pressurization of the pannier. The inlet shut-off valve is installed to a duct downstream of the cabin air silencer duct and feeds a tapping of cabin supply air to the pannier through two distribution pipes. The outlet shut-off valve is installed on the front face of the pannier and vents the pannier air to atmosphere through an outlet positioned between the main landing gear bay and the pannier.

Two smoke detectors are installed, one near the forward bulkhead, the other near the rear bulkhead, to give a warning if smoke is sensed in the pannier and, if AUTO is selected, to provide automatic closure of the shut-off valves.

2. Operation *(Figure 3)*

Normal operation of the shut-off valves is maintained by a PANNIER HEAT switch located on the pannier control panel 'WX' on the left side of the forward console, a temperature sensor located in the duct adjacent to the inlet shut-off valve, and a control relay.

Selecting the PANNIER HEAT switch to AUTO, causes the green half of the switch to come 'ON' and routes a supply from PE busbar to the temperature sensor. If the cabin conditioned air is above 68°F (20°C) the temperature sensor contacts close to complete the circuit to energize the temperature control relay. The contacts change over to route a supply from PE busbar, through the relaxed contacts of the SMOKE 1 and SMOKE 2 relays to the outlet valve open circuit. When the outlet valve is fully open its limit switch contacts change over, de-energizing the motor and providing a supply for the inlet valve open circuit. When open, cabin conditioned air is allowed to flow through the pannier.

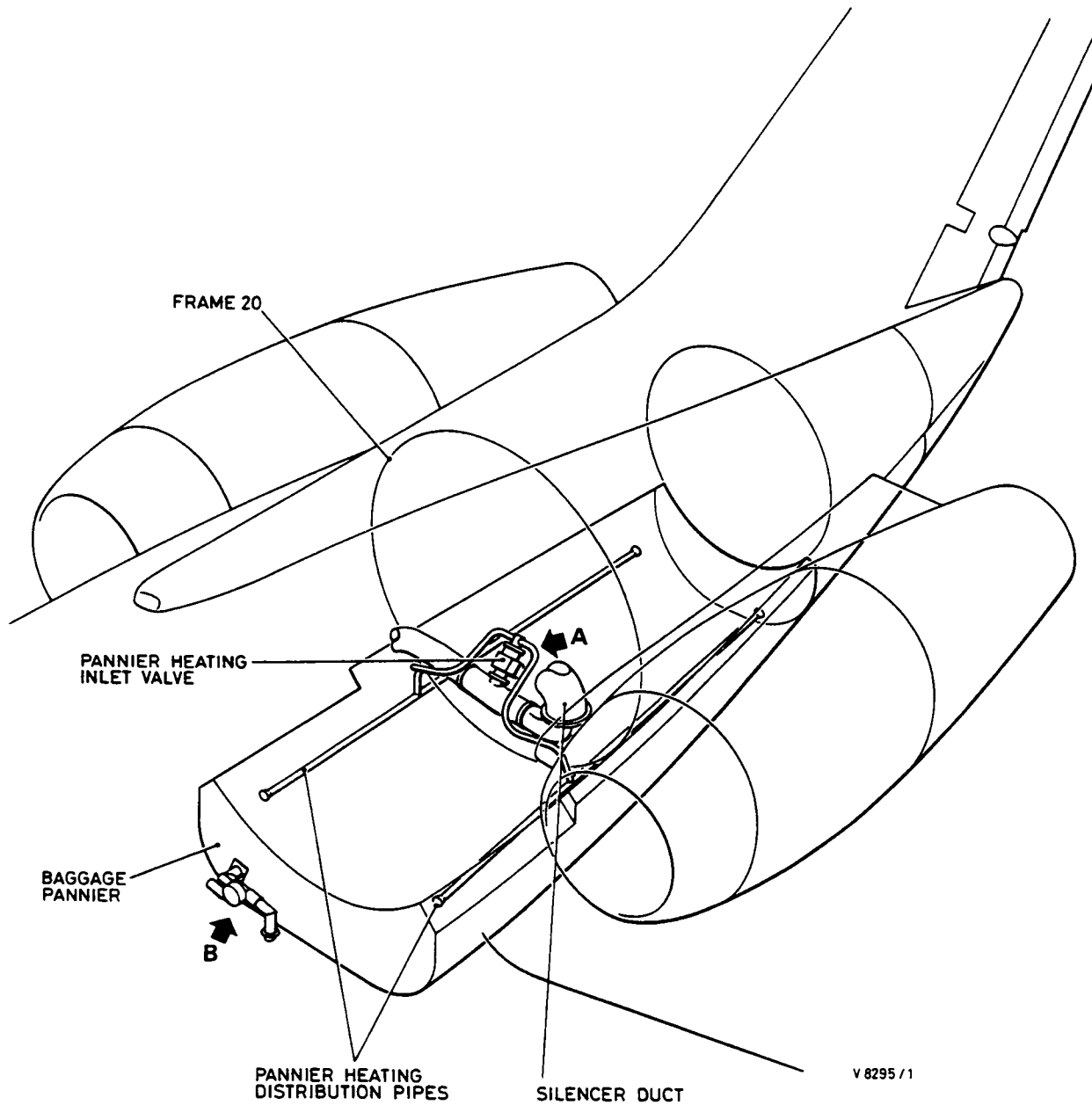
If the cabin conditioned air supply falls below 60°F (16°C) the temperature sensor contacts open, breaking the circuit to the temperature control relay coil. A supply from PE busbar is then directed through the relaxed contacts of the control relay to the inlet valve close circuit. The valve will fully close to change over its limit switch and de-energize the motor.

Operation of either the smoke detector will light its related red SMOKE annunciator on the pannier control panel and the amber PANNIER annunciator on the MWS, causing the MWS lamps to flash, and the related SMOKE relay will be energized. The SMOKE relay contacts change over to make a latching circuit in AUTO, disconnect all open demands from the shut-off valve, connects a supply to close the inlet valve, and when the inlet valve is fully closed, feeds a supply to light the white AIR VALVES SHUT annunciator on the pannier control panel and to the outlet valve close circuit.

Selecting the PANNIER HEAT switch to OFF turns the green AUTO light 'OFF' and turns the white OFF light 'ON'. It also connects a supply to the inlet valve close circuit. When the inlet valve is fully closed its limit switch contacts change over to connect a supply through the closed contacts of the PANNIER HEAT switch to light the white AIR VALVES SHUT annunciator and closes the outlet valve.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

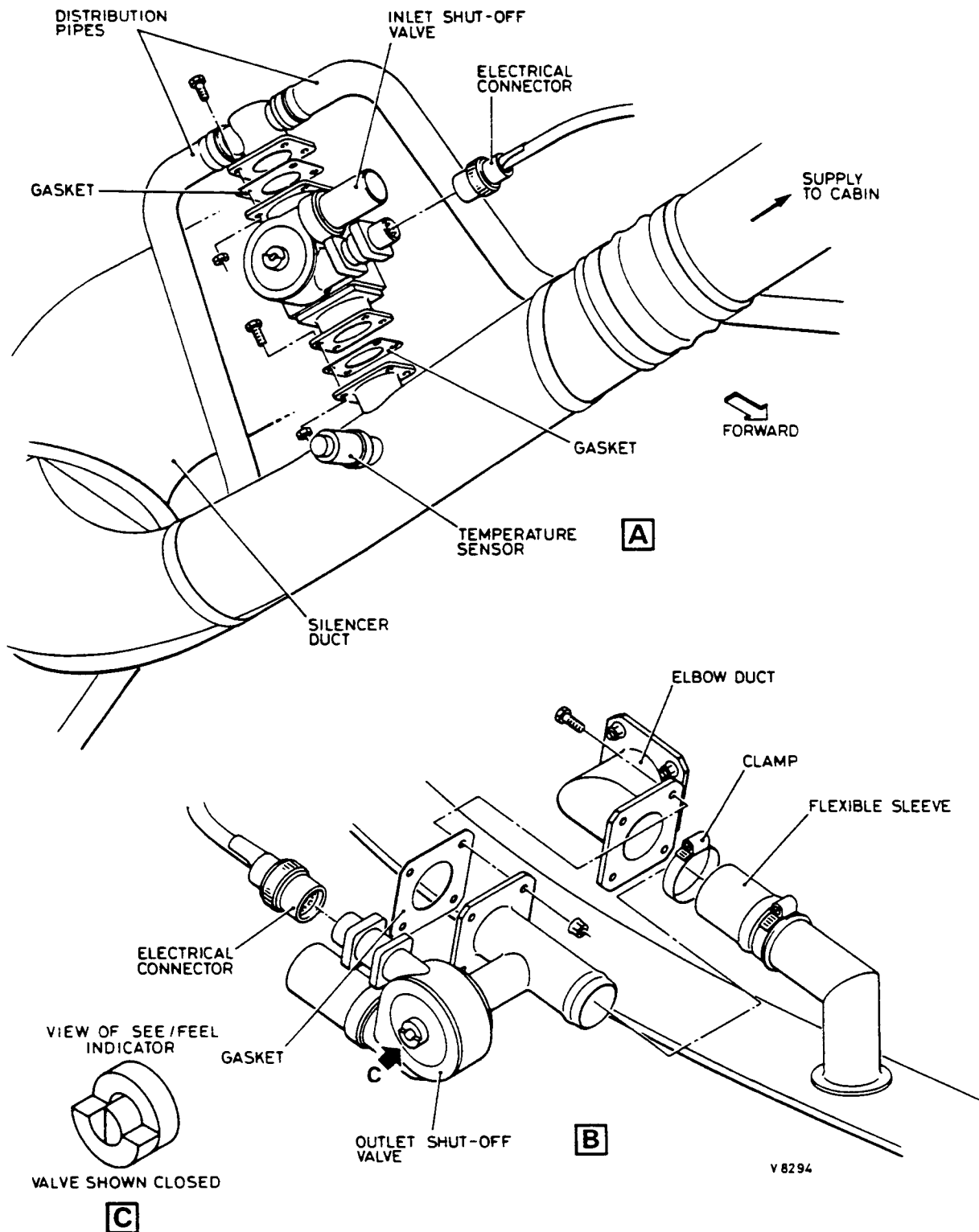


Panner heating - location of components

Figure 1

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

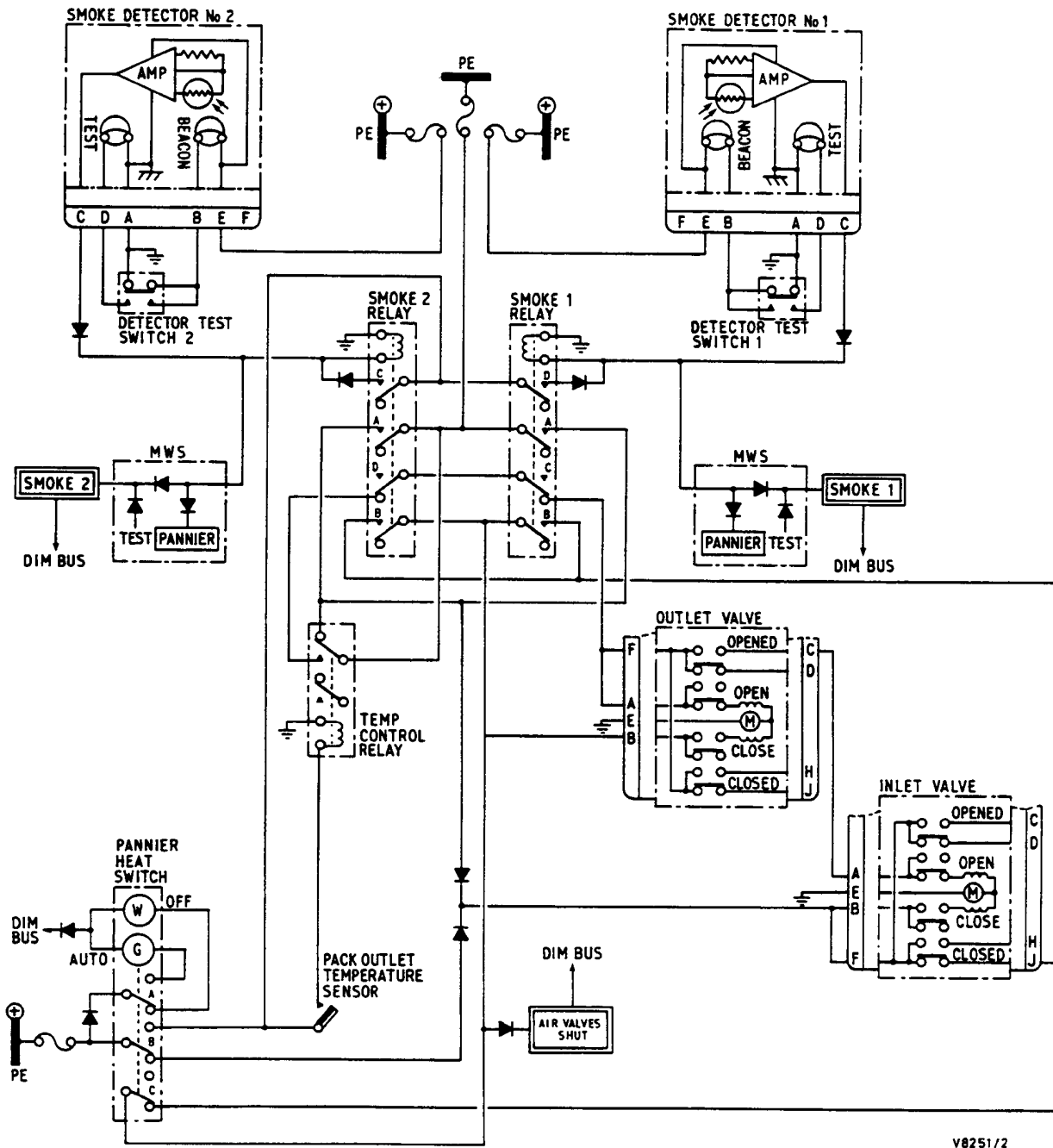


Pannier heating - location of components

Figure 2

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



V8251/2

Pannier heating - schematic
Figure 3

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

BAGGAGE PANNIER HEATING - REMOVAL/INSTALLATION

1. Inlet shut-off valve *(Figure 401)*

A. Removal

- (1) Identify and remove the fuses that follow. Put a safety notice in position to prevent the fuses being installed (Chapter 24, ELECTRICAL POWER):

Panel	Label
DA-H	F5
ZK	F71

- (2) Get access to the rear equipment bay.
- (3) Remove the four nuts and bolts that attach the distribution pipe tee-piece to the valve, remove and discard the gasket.
- (4) Disconnect the electrical connector from the valve actuator.
- (5) Remove the four nuts and bolts that attach the valve to the air duct, remove the valve and gasket, discard the gasket.
- (6) Install blanks on the air duct and distribution pipe.

B. Installation

- (1) Remove the blanks, put a new gasket in position on the air duct and install the valve. Install and tighten the nuts and bolts.
- (2) Put a new gasket in position on the valve, align the distribution pipe and install and tighten the nuts and bolts.
- (3) Connect the electrical connector to the valve actuator.
- (4) Remove the safety notice and install the fuses removed in paragraph 1.A.(1).
- (5) Do a test of the pannier heating valves (ADJUSTMENT/TEST).

C. Close up

- (1) Make sure that the work area is clean and clear of tools and miscellaneous equipment.

2. Outlet shut-off valve *(Figure 401)*

Equipment/Materials	Part/Item No.
Main landing gear door actuator clamps	25Y1491-31A

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

A. Removal

- (1) Identify and remove the fuses that follow. Put a safety notice in position to prevent the fuses being installed (Chapter 24, ELECTRICAL POWER):

Panel	Label
DA-H	F5
ZK	F71

- (2) Open the right main landing gear door and install the door retraction actuator clamp to the door retraction ram (Chapter 32, MAIN GEAR FAIRINGS AND DOORS).
- (3) Remove the access panel at rear of the right main landing gear bay.
- (4) Loosen the clamp that attaches the flexible sleeve to the valve.
- (5) Disconnect the electrical connector from the valve actuator.
- (6) Remove the nuts and bolts that attach the valve to the elbow duct, remove the valve and gasket, discard the gasket.
- (7) Install a blank to the elbow duct.

B. Installation

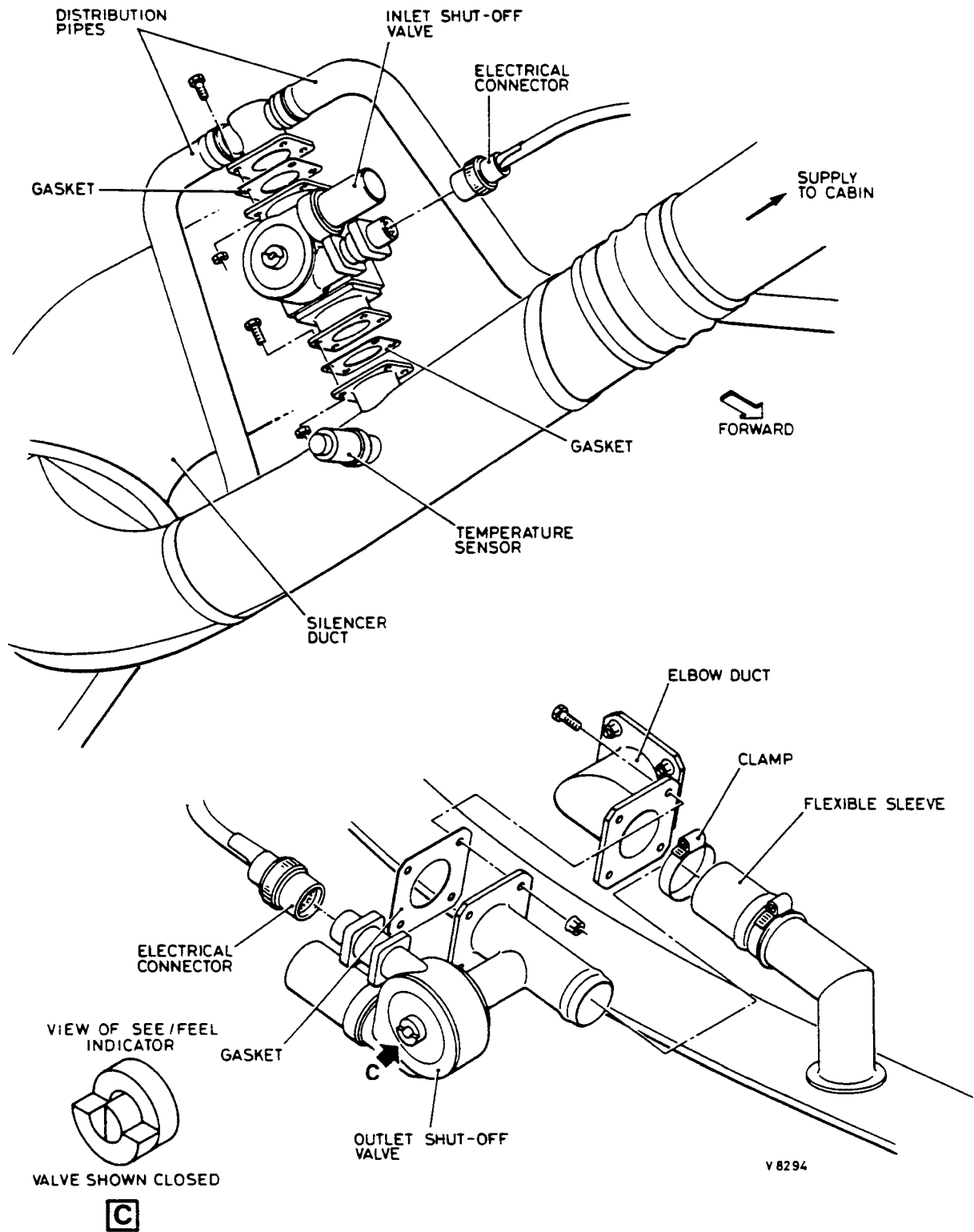
- (1) Remove the blank from the elbow duct, make sure the elbow duct and valve outlet duct are not blocked.
- (2) Put a new gasket in position, align the valve to the elbow and install the bolts and nuts. Tighten the nuts.
- (3) Connect the electrical connector to the valve actuator.
- (4) Install the flexible sleeve to the outlet valve, put the clamp in position and tighten the clamp.
- (5) Remove the safety notice and install the fuses removed in paragraph 2.A.(1).
- (6) Do a test of the pannier heating valves (ADJUSTMENT/TEST).
- (7) Install the access panel in right side of the main landing gear bay.
- (8) Remove the door retraction actuator clamp from the door retraction ram and use the ground servicing hand pump to close landing gear door (Chapter 32, MAIN GEAR FAIRINGS AND DOORS).

C. Close up

- (1) Make sure that the work area is clean and clear of tools and miscellaneous equipment.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



Pannier heating valves
Figure 401

EFFECTIVITY: 800XP

21-10-205

Page 403
Sep.03

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

BAGGAGE PANNIER HEATING - ADJUSTMENT/TEST

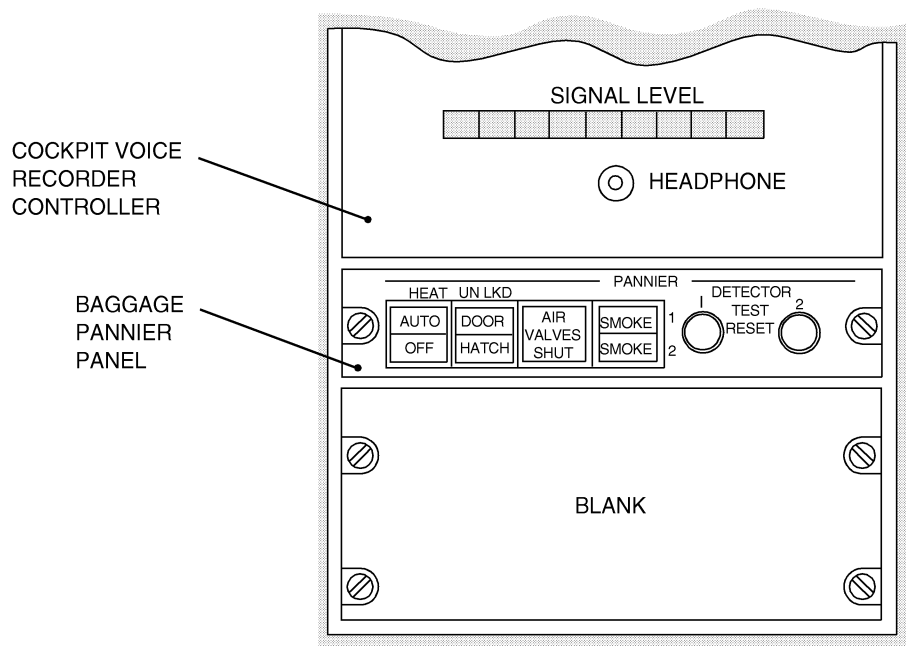
1. Test the pannier heating valves (Figure 501)

A. Procedure.

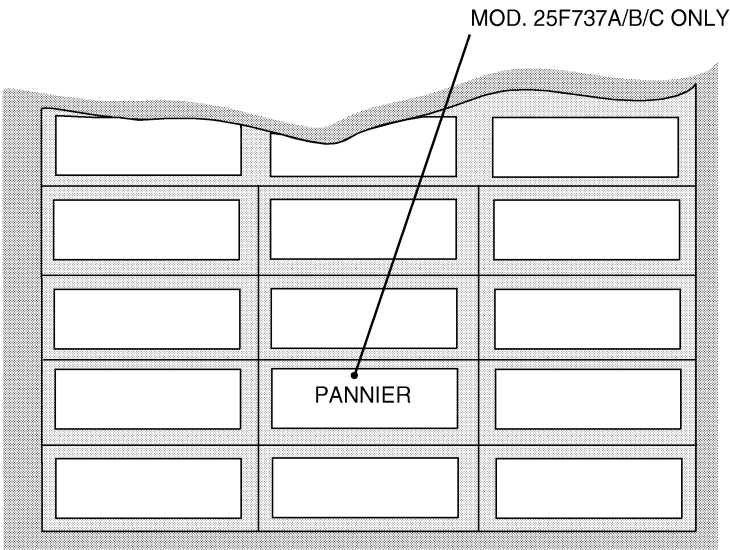
Action	Result
(1) Energize the DC busbars (Chapter 24, ELECTRICAL POWER).	... —
(2) On the pannier control panel 'WX' make sure that the PANNIER HEAT annunciator/switch is selected OFF	... (a) Annunciator white OFF legend is 'ON'. (b) Annunciator white AIR VALVES SHUT legend is 'ON'.
(3) In the rear equipment bay disconnect the temperature sensor and connect a shorting link across pins A and B of the free connector.	... —
(4) Set the PANNIER HEAT switch to AUTO	... (a) The annunciator white OFF legend goes 'OFF' and the green AUTO legend comes 'ON'. (b) The annunciator white AIR VALVES SHUT legend goes 'OFF'. (c) The outlet valve opens and then the inlet valve opens.
(5) Remove the shorting link from the temperature sensor free connector	... Make sure that the inlet valve closes.
(6) Install the shorting link to the temperature sensor free connector	... Make sure that the inlet valve opens.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



PART OF LEFT SIDE CONSOLE
MOD. 25F737A/B/C



PART OF MASTER WARNING PANEL

M7034
HA00B996277AA

Baggage pannier controls and annunciators
Figure 501

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

Action		Result
(7) On the pannier control panel push the No.1 smoke detector test switch	...	(a) The red SMOKE annunciator on panel 'WX' comes 'ON'. (b) The amber PANNIER annunciator on the MWS comes 'ON'. (c) The Master Warning (MWS) lamps flash. (d) The inlet and outlet valves close. (e) When the inlet valve is fully closed, the white AIR VALVES SHUT annunciator comes 'ON'
(8) Make sure the two air valves are closed by the use of the mechanical 'see-feel' indicators.	...	—
(9) Release the TEST switch	...	The AIR VALVES SHUT, SMOKE and PANNIER annunciators stay 'ON'.
(10) Set the PANNIER HEAT switch to OFF	...	(a) The SMOKE and PANNIER annunciators go 'OFF'. (b) The AIR VALVES SHUT annunciator stays 'ON'.
(11) Set the PANNIER HEAT switch to AUTO	...	(a) The AIR VALVES SHUT annunciator goes 'OFF'. (b) The outlet and then the inlet valves open.
(12) Do again paragraphs (7) thru (11) inclusive for the No.2 smoke detector TEST switch	...	Results as per (7) thru (11).
(13) Set the PANNIER HEAT switch to OFF	...	(a) The green AUTO legend is 'OFF'. (b) The white OFF legend is 'ON'. (c) The inlet valve closes. (d) The outlet valve closes. (e) When the outlet valve is fully closed, the white AIR VALVES SHUT annunciator comes 'ON'

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

Action	Result
(14) De-energize the DC busbars (Chapter 24, ELECTRICAL POWER).	... –
(15) Remove the shorting link and connect the temperature sensor.	... –

B. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING

PRESSURIZATION CONTROL DESCRIPTION AND OPERATION

1. DESCRIPTION

A. General

Cabin pressurization is achieved by the input of a constant supply of air from the engines and control of the outflow to get the necessary pressure in the cabin (Ref. Figure 1 and Figure 2).

Cabin pressure is controlled by two outflow/safety valves, one is installed at the bottom left of the cabin rear pressure bulkhead, and the other is installed at the top right of the pressure bulkhead. Both valves are calibrated for a cabin differential pressure setting of 8.65 ± 0.10 psi. The valves are automatically controlled in the same manner during normal system operation, but to overcome a malfunction of the system one valve can be manually controlled. Each valve operates on a pressure differential between cabin pressure and reference pressure sensed from the outflow/safety valve controller, through a pneumatic relay.

The outflow/safety valve controller, installed on the right instrument panel has two controls, one for selection of the desired cabin altitude and the other for selection of the desired cabin rate of change. The outflow/safety valve controller makes sure that the outflow/safety valves maintain a selected cabin altitude, also that cabin air pressure changes at an acceptable rate whenever different altitudes are selected, or during climb or descent.

Two identical pneumatic relays, installed on the cabin rear pressure bulkhead, sense cabin pressure changes as referenced by the outflow/safety valve controller, their purpose is to relay these changes to the outflow/safety valves to prevent delays in their response.

An air jet pump, installed on the cabin rear pressure bulkhead and connected into the ambient bleed line from the pneumatic relays, makes sure that there is a positive airflow from the outflow/safety valves reference chambers to ambient via the pneumatic relays, this makes sure that the desired differential between the outflow/safety valves reference and cabin pressure chambers is maintained. The jet pump is operated by engine bleed air tapped from the duct downstream of the mixing valves.

B. Safety Control

As a safety device, pressure regulators, set to maintain cabin altitude at Pre-Mod. 25G173A 13500 $\pm$ 1500 feet, Mod.25G173A 11000 +1500 feet, -500 feet in the event of system malfunction, are installed adjacent to each outflow/safety valve. They connect into the outflow/ safety valves reference chamber bleed lines and are open to cabin pressure. When the cabin altitude is more than the calibrated setting of the pressure regulator it operates to feed cabin air into the reference chamber bleed line. The introduction of cabin pressure air into the overflow/safety valve reference chamber equalizes the air pressure across the diaphragm, and allows the spring to close the outflow/safety valve.

C. Ground Air Conditioning

A fan operated venturi, installed on the cabin rear pressure bulkhead, is provided to create a pressure differential between the reference and pressure chambers of the outflow/safety valves. This is effected by the reduction of pressure in the reference chamber, so that the valves open to permit the escape of cabin air from the cabin during ground air conditioning. The venturi fan is controlled, through a landing gear operated microswitch, by a switch labeled PRESSN, with selections AUTO and OVRD, installed on the ENVIRONMENTAL section of the flight compartment roof panel.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

The venturi fan will only operate when:

- A main air valve is in an open position, or
- The APU master switch is selected ON.

A timing unit makes sure the venturi fan will operate for approximately 20 seconds after the airplane lands.

Two check valves isolate the venturi when it is not in use.

D. Manual Control

Two manually operated valves are provided in the system, both installed on the right console. One is a shut-off valve labeled PRESSURIZATION CONTROL with selections to NORMAL and GROUND TEST, the other is a needle valve labeled MANUAL CABIN ALTITUDE CONTROL with selections INCREASE and DECREASE. Both valves are used in conjunction with each other to provide manual control of the system in the event of system malfunction. The NORMAL/GROUND TEST valve is connected into the ambient bleed line from the outflow/safety valve controller and, when selected to GROUND TEST, shuts off the ambient bleed. The subsequent pressure increase within the controller is sensed by the reference chambers of the outflow/safety valves, with the result that the valves will close and become inoperative.

The MANUAL CABIN ALTITUDE CONTROL valve, when open, connects the reference chamber of the outflow/safety valve situated at the top right of the cabin rear pressure bulkhead to ambient via a venturi. This valve can, therefore, by control of the pressure differential between the outflow/safety valve reference and pressure chambers, assume complete control of valve operation, and so maintain the desired cabin altitude and rate of pressure change.

A ground cabin pressure connection, which is permanently installed in the keel area of the fuselage forward of frame 13, is provided for proof pressure testing of the cabin (Ref. 12-20-21, 301).

As an alternative procedure, a ground pressurization connection panel can be installed, during ground servicing, on the forward nose fuselage in place of either panel F152L or F153R (Ref. AFMS-800XP, Part 6). The ground pressurization connection panel must be removed and panel F152L or F153R must be installed before flight (Ref. 12-20-21, 301).

E. Indication

Cabin air pressure conditions are monitored by a cabin rate of change indicator, cabin altimeter and a cabin differential pressure indicator, located, in a triple instrument, on the right instrument panel.

A pressure (altitude) switch, situated at panel DA, operates if the cabin altitude rises to 9300 ± 300 ft. The switch lights a CABIN ALT red annunciator on the MWS panel, operates the MASTER WARN flashers and a warning horn. The horn can be cancelled by a HORN ISOLATE button on the left throttle knob. A CABIN ALT TEST button is provided to check the warning system. The horn is isolated when the flaps are lowered beyond 15° .

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



21-30-00

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



Figure 2 Pressurization Control System

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

A second pressure (altitude) switch, set to operate at 14000 ± 300 ft., is installed at panel 'DA'. The switch is connected in parallel with the first switch (set to operate at 9300 ± 300 ft.). The high altitude system is controlled by a CABIN HIGH DATUM push on/push off annunciator/switch installed on the right instrument panel. When selected 'ON' the annunciator/switch is lit and the caption shows CABIN HIGH DATUM. When the annunciator/switch is pushed again to de-select the system, the caption goes 'OFF' and the system goes back to the 9300 ft. altitude selection.

F. Inward Relief

To protect against a negative cabin differential, the outflow/safety valves each incorporate an inward relief facility. If ambient pressure is more than the cabin pressure calibrated limits, the valves will operate to permit ambient pressure to flow into the cabin. Under this condition the cabin altitude will change at airplane rates, regardless of control settings.

G. Cabin Pressure Relief

If the cabin pressure differential is more than the calibrated limits, pressure in the cabin must be reduced. To achieve this, pressure relief valves are incorporated in the outflow/safety valves. When cabin pressure is more than the relief valve setting, the valve will operate and permit air in the outflow/safety valve reference chamber to exhaust to ambient, the resulting pressure differential between the reference and cabin pressure chambers is sufficient to open the valve and reduce cabin pressure. Under this condition normal system control does not operate.

H. Cabin Dump

A lever controlled, friction-loaded butterfly valve supplies the means to control cabin differential pressure and rates of change if normal methods of system control do not operate, also it makes sure, when fully open, that there is no pressure differential on the airplane. The valve, which discharges air into the nose gear bay, is controlled from a lever located on the right side of the center instrument panel, the lever is operated between OPEN and SHUT to control the valve position.

2. OPERATION

A. Normal

With air conditioning in use a constant supply of air is fed into the cabin. Filtered air enters the outflow/safety valve controller reference chamber, and the outflow/safety valves pressure and reference chambers (Ref. Figure 2).

The normal function of both outflow/safety valves is identical so during the description that follows only one valve is referred to.

Selection of an altitude above station altitude on the outflow/safety controller repositions the isobaric bellows within the unit to open the metering valve.

Cabin pressure enters the controller reference chamber and passes through the metering valve to ambient, pressure within the chamber is also felt on the spring side of the pneumatic relay diaphragm. Pressure in the reference chamber of the outflow/safety valve is felt on the other side of the relay diaphragm and, when the pressure differential between the two sides of the diaphragm is sufficient to compress the spring, the relay metering valve lifts off its seat and permits outflow/safety valve reference chamber pressure to pass to ambient.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

Outflow/safety valve reference pressure now escapes at a faster rate than it enters the chamber, this brings about a pressure differential between the reference and pressure chambers sufficient to cause the valve to open and maintain an essentially unpressurized cabin, where airplane rate of climb is not more than the selected rate of pressure change.

As the cabin pressure enters the isobaric operational range, the isobaric bellows within the outflow/safety valve controller, expands and positions the unit metering valve to meter flow of reference chamber air to ambient. This produces an essentially constant pressure in the reference chamber which is felt in the pneumatic relay. Constant pressure in the spring side of the relay diaphragm makes sure that the outflow/safety valve reference chamber pressure on the other side of the diaphragm also remains constant. Under this condition variations in cabin pressure felt in the outflow/safety valve pressure chamber bring about changes in the pressure differential between the reference and pressure chambers, and causes the valve to open or shut in order to maintain the cabin pressure at the selected cabin altitude.

If the airplane rate of climb is more than the selected rate of change, the outflow/safety valve controller reference chamber pressure decreases and causes, due to the rate metering valve restriction of the passage of air from the rate chamber to the reference chamber, a pressure differential between these chambers sufficient to flex the valve diaphragm and move the reference chamber metering valve to restrict the flow of air to ambient. Pressure in the reference chamber will now change at the selected rate, causing the outflow/safety valve to control the rate of change of cabin pressure in accordance with that selected.

B. Manual

With the PRESSURIZATION CONTROL test valve selected to the GROUND TEST position the ambient bleed from the outflow/safety valve controller is shut off. Cabin pressure which enters the controller reference chamber cannot now bleed to ambient, this causes a pressure build up within the chamber, this will also be felt on the spring side of the pneumatic relay diaphragm which will flex to close the metering valve and prevent the outflow/safety valve reference chamber air to escape to ambient. The air pressure in the safety/outflow reference and pressure chambers equalize, which allows the spring in the reference chamber to close the valve.

The outflow safety valve installed at the top right of the cabin rear pressure bulkhead can now be controlled to give the desired cabin pressure and rate of change. With the MANUAL ALTITUDE CONTROL selected to INCREASE or DECREASE, the outflow/safety valve reference chamber pressure is allowed to escape to ambient.

This provides control of the pressure differential between the valve reference and pressure chambers and the subsequent control of valve operation, and makes sure the desired cabin pressure and rate of change is maintained.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING PRESSURIZATION CONTROL CABIN PRESSURE CONTROL SYSTEM TROUBLESHOOTING

1. INFORMATION

CAUTION: Plugs and caps must be installed to all pneumatic pipes and hoses opened during the following tests.

NOTE: The pitot/static test set must be pneumatic. Digital meters are not suitable for component leak tests.

Equipment/Materials	Part/Item No.
Leak testing fluid	604 (Ref. 125/H-20, 20-95-601)
Wire, corrosion resistant	651 (Ref. 125/H-20, 20-95-601)
Pitot/static test set	Druk or equivalent

2. PRESSURIZATION SYSTEM TROUBLE SHOOTING GUIDE

A. Procedure

- (1) Do a cabin pressurization check (Ref. 21-30-00, 501) and with the pressure at max differential pressure, check in the Rear Equipment Bay for bleed air leaks in all ducts and check joints for loose clamps/sleeves.

CAUTION: Do not exceed 8.75 psi differential.

- (2) Do a test of the cabin leak rate (Ref. 21-30-00, 501).

NOTE: The following troubleshooting sequence may vary depending on the type of pressurization issue.

- (3) Do a LP pressure switch test (Ref. 21-10-39, 201).
- (4) Do a functional test of the Mixer Valve (LP/HP) (Ref. 21-10-35, 501).
- (5) Do a functional test of the PRSOV (Ref. 21-10-76, 501).
- (6) Do the entire pressurization control system test that follows (Ref. Para 3. TESTS).

3. TESTS

A. Preparation

- (1) Remove all power from the airplane and disconnect the batteries. Put warning notices in position to prevent the application of electrical power to the airplane.
- (2) Get access to the forward side of the right instrument panel and the forward side of Frame 19 pressure bulkhead (Ref. Figure 101).

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

(3) Do the tests that follow (Ref. Figure 102).

(4) Make sure that the manual pressurization control knob is closed or in the full decrease position.

B. Test 1 - Pneumatic Leak Test on Assemblies and Connections Between Cabin Pressure Controller and Relay Assemblies

CAUTION: *The rate of change for the pitot/static test set is not to be more than 2000 feet per minute. Do not go over the 1000 foot setting as damage to the internal parts of the pneumatic relay may result.*

(1) On the back of the cabin pressure controller, disconnect the hose to the pneumatic relays labeled 'VALVE'.

(2) Connect the pitot/static test set to the hose.

(3) Slowly evacuate the pitot/static test set to 1000 feet above field altitude and close the vacuum control and the bleed valves on the test set.

(4) Observe the decrease in altitude on the altimeter for one minute; the altitude decrease must not be more than 100 feet in one minute.

(5) Open the bleed valve and slowly return the pitot/static test set to field altitude. If the leak at paragraph 3.B. (4) is greater than specified, do paragraphs (a) thru (c).

(a) Slowly apply a maximum positive pressure of 0.5 psid from the pitot/static test set (1000 feet below the field altitude on the altimeter) to identify the leak. After the leaking components are identified, open the bleed valve and slowly return the pitot/static test set to field altitude.

NOTE: To identify any leaks use leak testing fluid (Item 604) (Ref. AMM, 125/H-20, 20-10-354, 201).

(b) Repair any leak and/or replace the leaking component.

(c) Do again paragraphs 3.B. (3) thru (5).

(6) Disconnect the pitot/static test set from the hose.

(7) Connect the hose to the back of the pressure controller.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

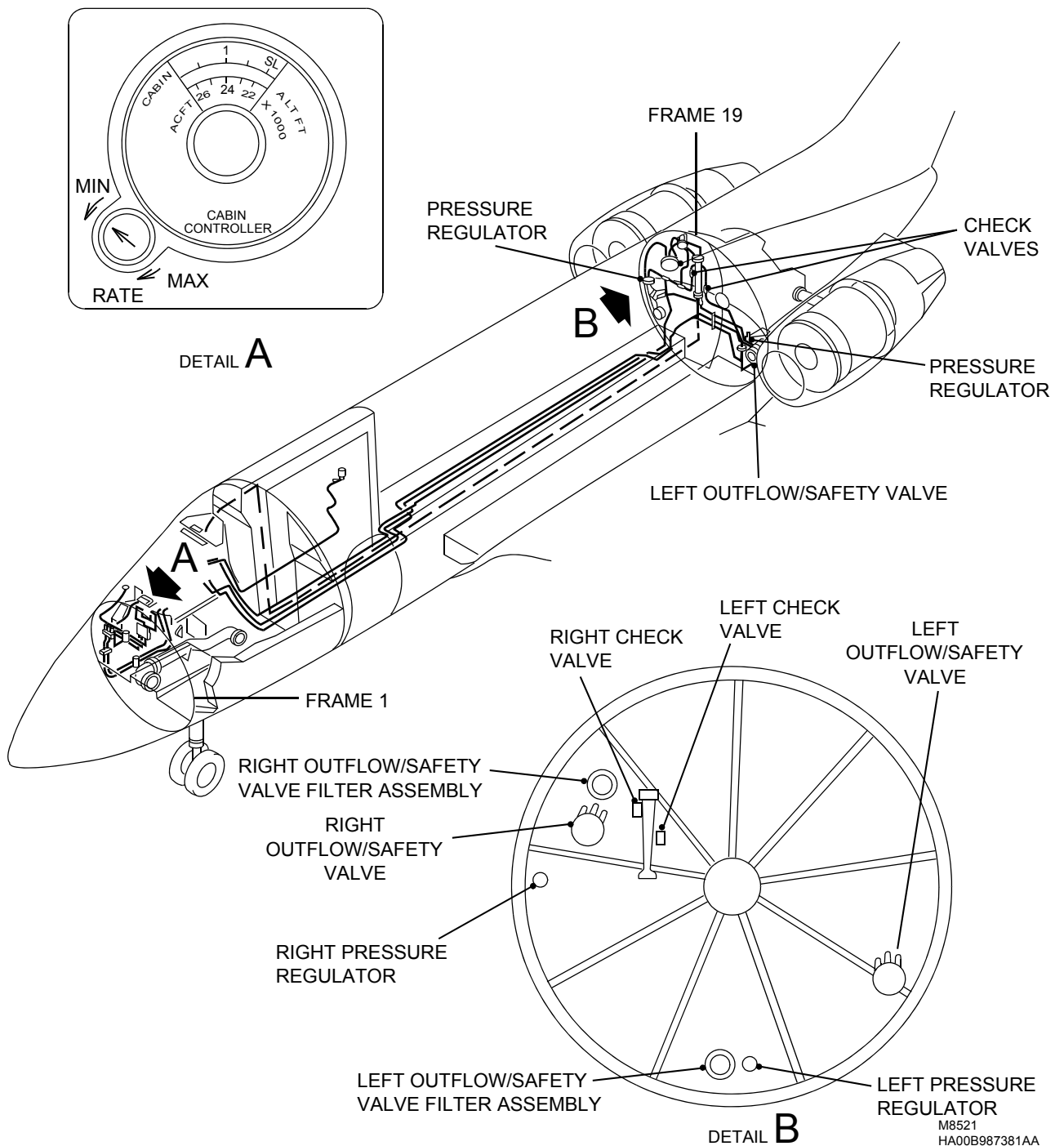
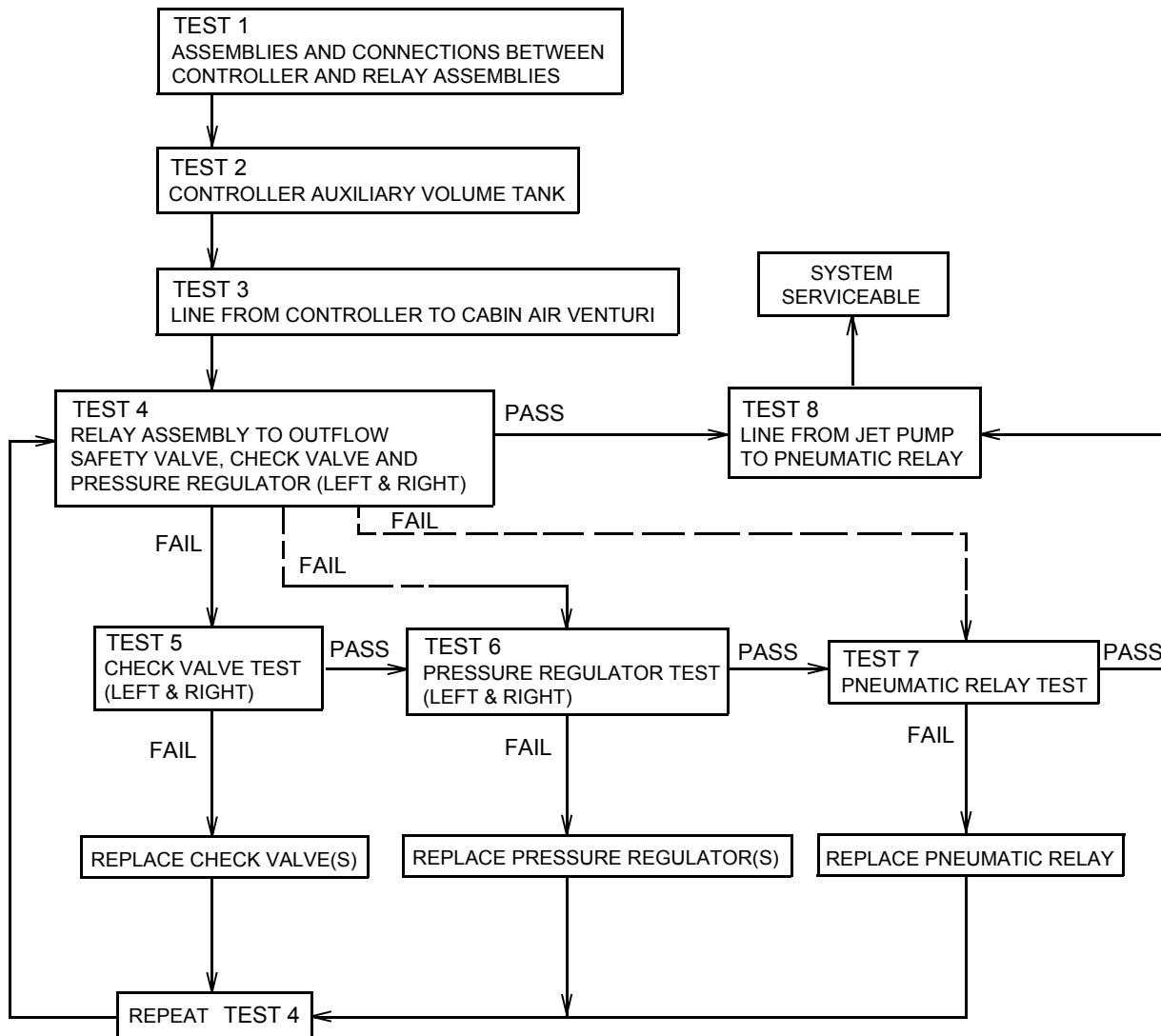


Figure 101
Airplane Pressurization System

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



M8520
HA00B987380AA

Figure 102
Pneumatic Leak Test Chart

C. Test 2 - Pneumatic Leak Tests on Cabin Pressure Controller Auxiliary Volume Tank

- (1) On the back of the cabin pressure controller, disconnect the hose to the auxiliary volume tank.
- (2) Connect the pitot/static test set to the hose.
- (3) Slowly evacuate the pitot/static test set to 1000 feet above field altitude and close the vacuum control and the bleed valves on the test set.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (4) Observe the decrease in altitude on the altimeter for one minute. The altitude decrease must not be more than 50 feet in one minute.
- (5) Open the bleed valve and slowly return the pitot/static test set to field altitude. If the leak at paragraph 3.C. (4) is greater than specified, do paragraphs (a) thru (c).
 - (a) Slowly apply a maximum positive pressure of 0.5 psid from the pitot/static test set (1000 feet below the field altitude on the altimeter) to identify the leak. After the leaking components are identified, open the bleed valve and slowly return the pitot/static test set to field altitude.

NOTE: To identify any leaks use leak testing fluid (Item 604) (Ref. AMM, 125/H-20, 20-10-354, 201).
 - (b) Repair any leaks and/or replace the leaking component.
 - (c) Do again paragraphs 3.C. (3) thru (5).
- (6) Disconnect the pitot/static test set from the hose.
- (7) Connect the hose to the back of the pressure controller.

D. Test 3 - Pneumatic Leak Test on Pipe from Cabin Pressure Controller to Cabin Air Venturi

- (1) On the back of the cabin pressure controller, disconnect the hose to the cabin air venturi.
- (2) Connect the pitot/static test set to the hose.
- (3) Disconnect the pipe at the cabin air venturi and install a pressure tight blank.
- (4) Slowly evacuate the pitot/static test set to 1000 feet above field altitude and close the vacuum control and the bleed valves on the test set.
- (5) Observe the decrease in altitude on the altimeter for one minute. The altitude decrease must not be more than 50 feet in one minute.
- (6) Open the bleed valve and slowly return the pitot/static test set to field altitude. If the leak at paragraph 3.D. (5) is greater than specified, do paragraphs (a) thru (c).
 - (a) Slowly apply a maximum positive pressure of 0.5 psid from the pitot/static test set (1000 feet below the field altitude on the altimeter) to identify the leak. After the leaking components are identified, open the bleed valve and slowly return the pitot/static test set to field altitude.

NOTE: To identify any leaks use leak testing fluid (Item 604) (Ref. AMM, 125/H-20, 20-10-354, 201).
 - (b) Repair any leaks and/or replace the leaking component.
 - (c) Do again paragraphs 3.D. (4) thru (6).
- (7) Disconnect the pitot/static test set from the hose.
- (8) Connect the pipe to the cabin air venturi.
- (9) Connect the hose to the back of the pressure controller.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

E. Test 4 - Pneumatic Leak Test on Relay Assembly to Outflow/Safety Valve, Check Valve and Pressure Regulator (Left and Right)

CAUTION: *The rate of change for the pitot/static test set is not to be more than 2000 feet per minute. Do not go over the 1000 foot setting as damage to the internal parts of the pneumatic relay may result.*

- (1) Remove the air filter from the outflow/safety valve, right for the right side test and left for the left side test and connect the pitot/static test set.
- (2) Slowly evacuate the pitot/static test set to 1000 feet above field altitude and close the vacuum control and the bleed valves on the test set.

NOTE: As the head of the outflow/safety valve is evacuated, the poppet valve will start to open. Allow the poppet to open fully before establishing 1000 foot test point.

- (3) Observe the decrease in altitude on the altimeter for one minute. The altitude decrease must not be more than 500 feet in one minute.
- (4) Open the bleed valve and slowly return the pitot/static test set to field altitude. If the leak at paragraph 3.E. (3) is greater than specified, do paragraphs (a) thru (e).

- (a) Disconnect the pipe from the fan operated venturi and install a pressure tight blank.
- (b) Slowly apply a maximum positive pressure of 0.5 psid from the pitot/static test set (1000 feet below the field altitude on the altimeter) to identify any leaks. After the leaking components are identified, open the bleed valve and slowly return the pitot/static test set to field altitude. If the leaks cannot be identified go to Test 5.

NOTE: To identify any leaks use leak testing fluid (Item 604) (Ref. AMM, 125/H-20, 20-10-354, 201).

- (c) Repair any leaks and/or replace the leaking component.
- (d) Do again paragraphs 3.E. (2) thru (4).
- (e) Reconnect the pipe to the fan-operated venturi.
- (5) Disconnect the pitot/static test set from the air filter assembly.
- (6) Install the right (left) outflow valve filter assembly to the right (left) outflow/safety valve.

F. Test 5 - Check Valve Leak Test

- (1) Remove the check valve assembly.
- (2) Connect the check valve to the pitot/static test set so that vacuum is applied against the direction of flow.
- (3) Slowly evacuate the pitot/static test set to 1000 feet above field altitude and close the vacuum control and the bleed valves on the test set.
- (4) Record the decrease in altitude on the altimeter.
- (5) Open the bleed valve and slowly return the pitot/static test set to field altitude.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (6) Disconnect the pitot/static test set.
- (7) Based on the recorded decrease in altitude in paragraph 3.F. (4), do as follows:
 - (a) If the leak is more than 200 feet in one minute, replace the check valve.
 - (b) If the leak is less than 200 feet in one minute, go to Test 6.
 - (c) If a leak is found and the component is replaced do Test 4 again.
 - (d) If Test 4 continues to show leaks of more than 500 feet in one minute, go to Test 6.
- (8) Install the check valve assembly.

G. Test 6 - Pressure Regulator Leak Test

- (1) Remove the pressure regulator (Ref. 21-30-55, 201).
- (2) Connect the pressure regulator to the pitot/static test set.
- (3) Slowly evacuate the pitot/static test set to 1000 feet above field altitude and close the vacuum control and the bleed valves on the test set.
- (4) Record the decrease in altitude on the altimeter.
- (5) Open the bleed valve and slowly return the pitot/static test set to field altitude.
- (6) Disconnect the pitot/static test set.
- (7) Based on the recorded decrease in altitude in paragraph 3.G. (4), do as follows:
 - (a) If the leak is more than 300 feet in one minute, replace the pressure regulator (Ref. 21-30-55, 201).
 - (b) If the leak is less than 300 feet in one minute, go to Test 7.
 - (c) If a leak is found and the component is replaced do Test 4 again.
 - (d) If Test 4 continues to show leaks of more than 500 feet in one minute, go to Test 7.
- (8) Install the pressure regulator (Ref. 21-30-55, 201).

H. Test 7- Pneumatic Relay Leak Test

CAUTION: *The rate of change for the pitot/static test set is not to be more than 2000 feet per minute. Do not go over the 1000 foot setting as damage to the internal parts of the pneumatic relay may result.*

- (1) Disconnect the pneumatic relay from the pipe to the outflow valve assembly.
- (2) Connect the pneumatic relay to the pitot/static test set.
- (3) Slowly evacuate the pitot/static test set to 1000 feet above field altitude and close the vacuum control and the bleed valves on the test set.
- (4) Record the decrease in altitude on the altimeter.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (5) Open the bleed valve and slowly return the pitot/static test set to field altitude.
- (6) Disconnect the pitot/static test set.
- (7) Based on the recorded decrease in altitude in paragraph 3.H. (4), do as follows:
 - (a) If the leak is more than 200 feet in one minute, replace the pneumatic relay (Ref. 21-30-35, 401).
 - (b) If a leak is found and the component is replaced do Test 4 again.
- (8) Connect the pipe to the pneumatic relay.

I. Test 8 - Pneumatic Leak Test on Pipe From Jet Pump to Pneumatic Relays

- (1) Disconnect the pipe from the jet pump.
- (2) Connect the pitot/static test set to the pipe.
- (3) Disconnect the pipes from the left and right relays and install a pressure tight blank to each pipe.
- (4) Slowly evacuate the pitot/static test set to 1000 feet above field altitude and close the vacuum control and the bleed valves on the test set.
- (5) Observe the decrease in altitude on the altimeter for one minute. The altitude decrease must not be more than 50 feet in one minute.
- (6) Open the bleed valve and slowly return the pitot/static test set to field altitude. If the leak at paragraph 3.I. (5) is greater than specified, do paragraphs (a) thru (c).
 - (a) Slowly apply a maximum positive pressure of 0.5 psid from the pitot/static test set (1000 feet below the field altitude on the altimeter) to identify any leaks. After the leaking components are identified, open the bleed valve and slowly return the pitot/static test set to field altitude.

NOTE: To identify any leaks use leak testing fluid (Item 604) (Ref. AMM, 125/H-20, 20-10-354, 201).
 - (b) Repair any leaks and/or replace the leaking component.
 - (c) Do again paragraphs 3.I. (4) thru (6).
- (7) Disconnect the pitot/static test set from the pipe.
- (8) Connect the pipe to the jet pump.
- (9) Connect the pipes to the left and right relays.

4. COMPLETION

A. Procedure

- (1) Make sure that all disturbed connections are locked with wire (Item 651) as necessary.
- (2) Reconnect the airplane batteries and remove the warning signs.

Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (3) Do a functional test of the airplane pressurization system (Ref. 21-30-00, 501).
- (4) Replace removed equipment and panels.

B. Close Up

- (1) Make sure that the work place is clean and clear of tools and other equipment.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING PRESSURIZATION CONTROL

ADJUSTMENT/TEST

1. INFORMATION

Equipment/Materials	Part/Item No.
Wire corrosion resistant	651 (Ref. AMM 125/H-20, 20-95-601)

NOTE: Before doing a test which involves pressurizing, the following precautions and recommendations are to be observed.

A. Precautions

- (1) Make sure that the airplane structure is complete and fit for flight.
- (2) Make sure that the static and pitot pipelines, in the pressurized area, are complete and connected to their relevant unit. If this is not possible the unit must be removed and the pipelines blanked.
- (3) Make sure that all doors, hatches and windows in the pressurized area are fully closed.
- (4) It is recommended that personnel taking part in the pressure tests within the pressurized fuselage are certified medically fit within the test requirements; this includes freedom from colds and sinus trouble.
- (5) A minimum of two operators must be inside the fuselage during a pressure test using an external rig as the supply source. When using engines as the supply source a third operator, to run the engines, is required.
- (6) When using an external rig as the supply source, intercommunication must be established between personnel inside and outside the fuselage.

B. Pressurizing Procedures

- (1) The fuselage can be pressurized by the following means:
 - Main engine(s).
 - Auxiliary power unit.
 - An external rig connected to the permanent ground pressurization connection panel (Ref. 12-20-21, 301). The panel is attached to the left fuselage keel area just forward of frame 13, inside panel W503 (Ref. AFMS 125-800XP, Part 6).
 - As an alternative procedure, an external rig connected to the ground pressurization connector panel, installed during ground pressurization only, on the forward nose fuselage keel area (Ref. 12-20-21, 301).

NOTE: Although fuselage pressurization can be done from any of the above sources, a main engine must be running, at least at idle rpm, to provide air to operate the pressurization control system.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (2) Up to a pressure differential of 8 psi the rate of change of cabin altitude must not exceed 2000 ft./min. Above 8 psi the rate of change must not exceed 1000 ft./min. The rate of change is indicated on the cabin rate of climb indicator.
- (3) When de-pressurizing, the rate of change must not exceed 2000 ft./min.

WARNING: Should the leak rate increase unduly during any pressure test, as indicated by a sudden change in the reading on the cabin rate of climb indicator, the pressure must be released and the fuselage inspected for damage before the test is continued.

- (4) The differential pressure across the structure must not exceed 8.75 psi.

C. Test Instruments

- (1) When pressure tests are done using an external source, connect pressure test instruments to the ground pressurization connection panel that is being used (Ref. 12-20-21-301).
- (2) The calibration of all instruments used in pressure testing must be accurately checked.
- (3) A vibrator should be installed to the instrument panel to prevent the instruments sticking, alternatively gently tap the instruments.

2. FUNCTIONALLY TEST PRESSURIZATION SYSTEM

A. Procedure

NOTE: During the following system test it is necessary to have an engine running at idle for operation of the pressurization control system (air jet pump).

NOTE: Pressurization air may, however, be supplied by the following alternative sources:

- Main engine (s).
- The auxiliary power unit.
- An air supply rig connected to the fuselage permanent ground test connection panel (Ref. 12-20-21, 301).
- As an alternative, an air supply rig connected to the forward nose fuselage ground test connection panel (Ref. 12-20-21, 301).

- (1) Observe instructions contained in Paragraph 1.A (Precautions).
- (2) Make sure cabin dump valve is SHUT.
- (3) Make sure that the fan venturi PRESSN switch is at OVRD.
- (4) Run the engines at ground idle (Ref. 71-00-00, 501). If necessary start APU (Ref. 49-11-00, 501 or 49-16-00, 501).
- (5) Select cabin temperature to AUTO and adjust to required setting.
- (6) On the CABIN PRESSURE CONTROLLER set CABIN ALT control fully counterclockwise and set RATE control at MIN (fully counterclockwise).

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (7) Set both MAIN AIR VLV switches to OPEN, check MAIN AIR VALVE annunciators illuminate, if APU is used, select APU AIR switch to OPEN or operate the ground pressurization rig.
- (8) Make sure the rate of descent is at least 25 ft./min., if engine air is used for pressurizing it will be necessary to progressively increase both engine speeds to 75% N_1 .
- (9) Set both engines to ground idle and set MAIN AIR VLV switches to CLOSE, if APU is used, set APU AIR switch to CLOSE, or switch off ground pressurization rig. Allow any pressure in cabin to disperse.
- (10) On the CABIN PRESSURE CONTROLLER check CABIN ALT control fully counterclockwise and set RATE control at MAX (fully clockwise).
- (11) Set both MAIN AIR VLV switches to OPEN, check MAIN AIR VALVE annunciators illuminate, if APU is used, select APU AIR switch to OPEN, or operate the ground pressurization rig.
- (12) Make sure the rate of descent is not greater than 3000 ft./min., if engine air is used for pressurizing it will be necessary to progressively increase both engine speeds to 75% N_1 .
- (13) Set both engines to ground idle and set MAIN AIR VLV switches to CLOSE, if APU is used, set APU AIR switch to CLOSE, or switch off ground pressurization rig. Allow any cabin pressure to disperse.
- (14) On right console, set PRESSURIZATION CONTROL at GROUND TEST and set MANUAL CABIN ALTITUDE CONTROL at full INCREASE (fully counterclockwise).
- (15) Set both MAIN AIR VLV switches to OPEN, if APU is used, set APU AIR switch to OPEN or operate ground pressurization rig.
- (16) Allow initial surge to settle and if engine air is used for pressurizing, progressively increase both engine speeds to 75% N_1 , slowly close (rotating clockwise) the MANUAL CABIN ALTITUDE CONTROL making certain cabin rate does not exceed 2000 ft./min.
- (17) Make sure the INCREASE and DECREASE control is available and is controlled by the right hand outflow safety valve. Check the left hand outflow safety valve remains closed.
- (18) Continue closing the MANUAL CABIN ALTITUDE CONTROL (rotating clockwise towards DECREASE) making certain cabin rate of change does not exceed 2000 ft./min., until cabin differential pressure reaches 8 psi.

CAUTION: *Do not exceed 8.75 psi differential.*
- (19) Maintaining a rate of change of 1000 ft./min., continue pressurizing and check that cabin differential pressure is controlled at not less than 8.55 psi and not more than 8.75 psi.
- (20) Reduce cabin pressure by slowly opening (rotating counterclockwise towards INCREASE) the MANUAL CABIN ALTITUDE CONTROL, allow cabin pressure to fall to zero and open dump valve.
- (21) Set cabin temperature to COOL position and, if engine air is being used, set both engines to idle and MAIN AIR VLV switches to CLOSE. If APU is being used, set APU AIR switch to CLOSE or switch off the ground pressurization rig.
- (22) Shut down engines (Ref. 71-00-00, 501) or APU (Ref. 49-11-00, 501 or 49-16-00, 501).

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (23) Rotate MANUAL CABIN ALTITUDE CONTROL clockwise to full DECREASE position.
- (24) Set PRESSURIZATION CONTROL to NORMAL position.
- (25) Set PRESSN switch to AUTO and close dump valve.
- (26) If applicable:
 - (a) Disconnect the ground air supply rig and instruments. Install the ground test connection blanks and lock with wire (Item 651) (Ref. 12-20-21, 301).
 - (b) Disconnect the ground air supply rig and instruments and remove the ground connection panel (Ref. 12-20-21, 301).
- (27) Remove the instrument panel vibrator (if installed).

B. Close Up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

3. TEST CABIN LEAK RATE

NOTE: This test is to make sure the cabin leak rate is within the specified limit.

A. Procedure

- (1) Observe instructions contained in Paragraph 1.A (Precautions).
- (2) Blank off venturi located forward of cabin windows on right-hand side using a locally procured expansion plug.
- (3) Make sure the cabin dump valve is OPEN.
- (4) Make sure the fan venturi PRESSN switch is selected to OVRD.
- (5) Operate PRESSURIZATION CONTROL TEST VALVE selector to the GROUND TEST position.
- (6) Operate the MANUAL CABIN ALTITUDE CONTROL selector to the fully DECREASE position.
- (7) Introduce the air supply, to pressurize the fuselage, by one of the following:
 - (a) An air supply rig connected to a ground test connection (Ref. 12-20-21, 301).
 - (b) Run the engines (Ref. 71-00-00, 501), observing rate of change limitations detailed in paragraph (9).
 - (c) Run the auxiliary power unit (Ref. 49-11-00, 501 or 49-16-00, 501).
- (8) If engine supply air is being utilized, select both MAIN AIR VLV switches to OPEN. Check that the MAIN AIR VLV annunciators light. Select the cabin temperature control AUTO/MANUAL switch to AUTO and temperature as required.
- (9) Progressively close cabin dump valve and allow differential pressure to rise to a figure above 4 psi at a rate of change not exceeding 2000 ft./min., and shut off air supply.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (10) Allow pressure to drop by normal leakage and check that the time taken for the pressure to fall from 4 to 3 psi is not less than 45 seconds.
- (11) Depressurize the fuselage by slowly opening the dump valve; the rate of change is not to exceed 2000 ft./min.
- (12) Shut down engines (Ref. 71-00-00, 501), auxiliary power unit (Ref. 49-11-00, 501 or 49-16-00, 501) or switch off the ground air supply.
- (13) Set PRESSN switch to AUTO and close dump valve.
- (14) Operate PRESSURIZATION CONTROL TEST VALVE selector to the NORMAL FLIGHT position.
- (15) Remove blank from the venturi.
- (16) If applicable:
 - (a) Disconnect the ground air supply rig and instruments. Install the ground test connection blanks and lock with wire (Item 651) (Ref. 12-20-21, 301).
 - (b) Disconnect the ground air supply rig and instruments and remove the ground connection panel (Ref. 12-20-21, 301).

B. Close Up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

OUTFLOW/SAFETY VALVE CONTROLLER - DESCRIPTION AND OPERATION

1. Description *(Figure 1)*

The outflow/safety valve (cabin air pressure) controller is the control module for the cabin pressurization system. The controller automatically controls cabin pressure by proportionally releasing cabin air to atmosphere through one or both outflow valves.

The body of the controller is composed of three elements. The first element forms a chamber which is open to cabin pressure and houses the absolute bellows. One end of the bellows is secured to an actuator which is moved, to compress or extend the bellows, by rotating the cabin altitude selector knob. The opposite end of the bellows passes through the end of the chamber and is limited to a specific travel by a bellows stop. The cabin rate control selector knob is secured to a rate control valve actuator. Rotation of the rate selector knob will position the rate control valve to a desired position. One side of the second element, when assembled to the first element, completes the cabin pressure chamber and seals the cabin pressure chamber from the rest of the controller with a sealing diaphragm. The opposite side of the second element forms a rate pressure chamber which houses the rate spring. One side of the rate spring is secured to the isobaric bellows and the other side of the spring is secured to the rate diaphragm.

The second element also contains the rate control valve and orifice and an air passage to allow movement of air to the auxiliary volume tank through the auxiliary volume tank connection. The second element also incorporates a check valve. When cabin pressure decreases below rate pressure, the check valve will allow air to flow from the rate pressure chamber to the cabin pressure chamber.

The third element, when assembled to the rate diaphragm, and other two elements, forms a reference pressure chamber which houses the reference pressure metering valve and metering valve follower spring. One side of the spring is secured to the third element by a rotating member, and the other end incorporates the reference pressure metering valve. This element also contains passages for air to pass from the controller to connections for installation in the cabin pressure control system. The connections on the rear of the third element are the cabin air filter with orifice, the aircraft AMBIENT connection, the auxiliary volume TANK connection, and the outflow VALVE connection.

The selective cabin pressure rate-of-change system consists of rate-of-change spring, diaphragm and valve. The valve assembly is controlled by the cabin rate control selector knob.

The face of the controller is internally lighted from the aircraft electrical supplies.

To provide improved accuracy and ensure sufficient air at rate controlled pressure is always available, an auxiliary volume tank is connected by pipe to the rate pressure chamber.

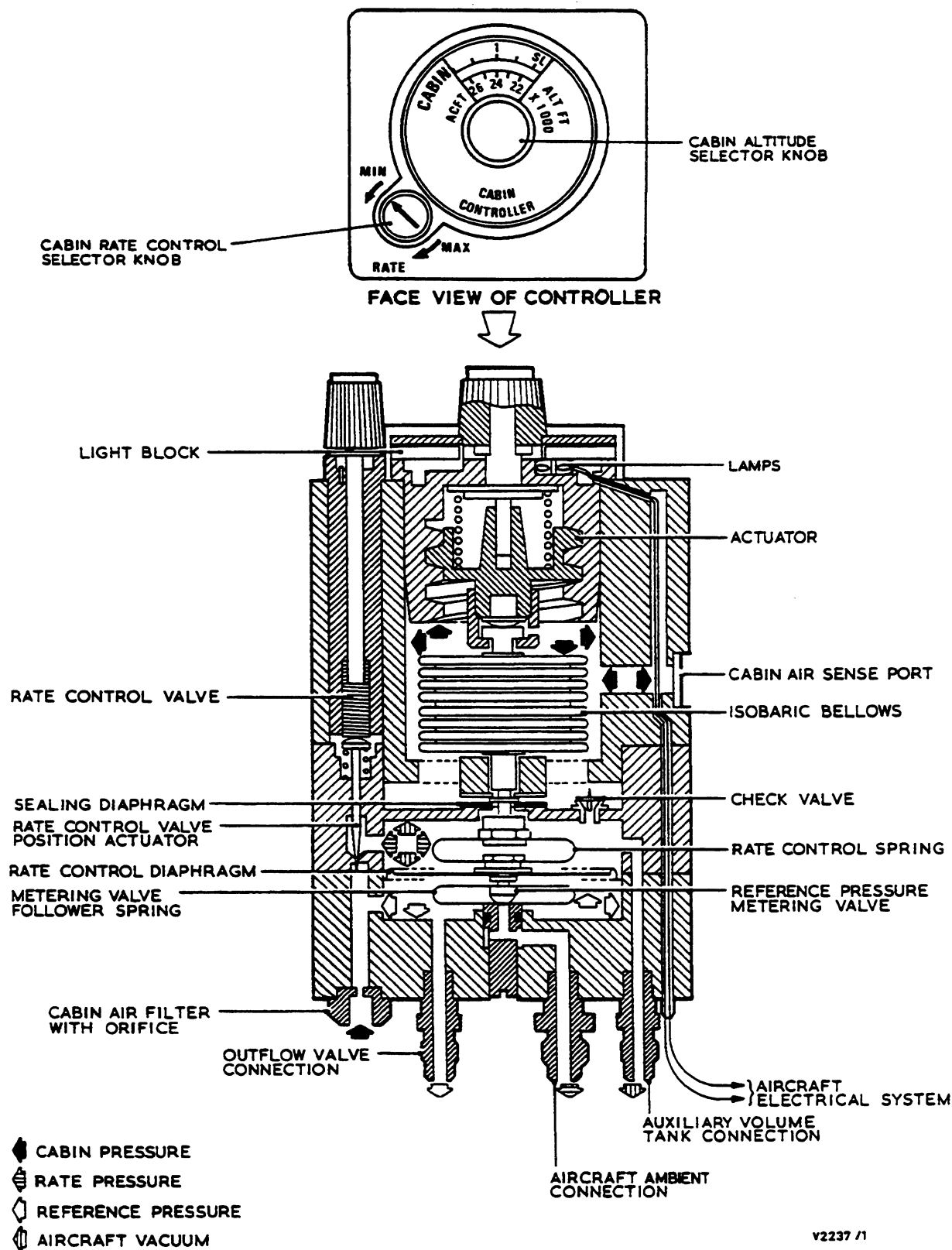
2. Operation

General

The cabin altitude selector knob adjusts cabin altitude scale to the desired (pre-set) setting as shown by the outer scale.

The cabin rate control selector knob adjusts the rate control valve to the desired rate-of-change setting.

The controller controls the operating pressures for the safety/outflow valves.



Cabin pressure controller - schematic
Figure 1

v2237 /1

EFFECTIVITY:

800XP

21-30-16

Page 2

July 95



HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

Unpressurized operation

During normal operation, reference chamber pressure is vented to atmosphere through the open safety valve.

Setting the cabin altitude control to an altitude above station altitude, rotates the actuator which extends the isobaric bellows. This movement will open the reference pressure metering valve by deflecting the rate spring and the metering valve follower spring and valve. This allows a proportion of cabin air, which flows into the reference chamber through the cabin air filtered orifice, to flow out through the vacuum connection, via the pneumatic relay valves to atmosphere. Pressure in the reference chamber is sensed by the outflow valves, through the AMBIENT connection and the valves operate to maintain an essentially unpressurized cabin, provided aircraft rate-of-climb does not exceed selected cabin rate-of-change.

Isobaric operation

As aircraft cabin pressure enters the isobaric operating range, the isobaric bellows expand and re-positions the isobaric metering valve to meter reference chamber pressure to atmosphere. With reference chamber pressure maintained essentially constant by the isobaric bellows and metering valve, reference pressure in the outflow/safety valves remains constant and variations in cabin pressure act directly on the outflow/ safety valves diaphragms to position the safety valves poppets and control cabin pressure to the selected cruising attitude.

Selective pressure rate-of-change

When aircraft rate-of-climb exceeds the selected rate, reference pressure is reduced; this results in a pressure differential across the rate control diaphragm because of the restricted flow from the rate chamber to the reference chamber. This pressure differential causes the rate control diaphragm to move the isobaric metering valve to limit flow of air from the reference chamber so that reference pressure will change at the selected rate. The outflow/safety valves react to control the rate of change of cabin pressure accordingly.

Data

Isobaric range	Selective from sea level to 10 000 ft. above sea level
Selective pressure rate-of-change control	175 to 2500 ft/min.(approx.)
Calibration point	500 ft/min.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING PRESSURIZATION CONTROL OUTFLOW/SAFETY VALVE CONTROLLER REMOVAL/INSTALLATION

1. INFORMATION

Equipment/Materials	Part/Item No.
Corrosion resistant wire	651 (Chapter 20-95-601)
Teflon Spiral Wrap (1/4 in by 12 ins.)	Local supply

2. PROCEDURE

A. Removal

	MECH	INSP
(1) On panel AA in the nose compartment, remove fuse F2 (Ref. 24-01-00, 201).		
(2) Hinge open right-hand instrument panel.		
(3) Remove plastic cover and disconnect electrical cables from the controller terminals.		
(4) Disconnect ambient bleed and auxiliary volume tank pipelines from the controller.		
(5) Disconnect outflow/safety valves sensing pipelines from the controller.		
(6) Remove screws securing controller to the panel, and withdraw controller.		
(7) Remove transilluminated panel from face of controller (if controller is to be changed).		
(8) Install blanks to open pipelines and controller connections.		

B. Installation

CAUTION: Make sure the electric cables do not foul during installation of the unit.

CAUTION: Make sure none of the hoses are kinked before installation of the unit.

	MECH	INSP
(1) Remove blanks from pipelines and controller connections.		
(2) Assemble transilluminated panel to face of controller (if controller is new).		
(3) Position controller in instrument panel, and secure using screws.		
(4) Connect outflow/safety valves sensing pipeline to the controller.		
(5) Connect auxiliary volume tank pipeline to the controller.		

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(6) Connect ambient bleed pipeline to the controller.		
NOTE Wrap the three Controller pipelines with Teflon Spiral Wrap (¼ in. by 12 ins.).		
(7) Connect electrical cables to the unit terminals and install terminal cover.		
(8) Lock the pipeline unions with wire (Item 651).		
(9) Close and secure instrument panel.		
(10) Install fuse F2 on panel AA (removed in para. 2.A.(1)).		
(11) Functionally test the pressurization system (Ref. 21-30-00, 501).		

C. Close Up

- (1) Make sure that the work area is clean and clear of tools and other equipment.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING PRESSURIZATION CONTROL OUTFLOW/SAFETY VALVE DESCRIPTION AND OPERATION

1. DESCRIPTION

The cabin air pressure safety valve consists of a base assembly and cover assembly.

The base assembly contains an outflow poppet valve, outflow valve diaphragm, outflow valve cover plate, and an atmosphere bleed port.

The cover assembly contains an outflow poppet valve spring, pressure relief system, cabin air sense ports, true static atmosphere port, cabin air inlet orifice and filter connection, and pneumatic relay connection.

The outflow poppet valve and outflow valve cover plate are connected together and suspended on the outflow valve diaphragm. The outflow valve shaft extends through the outflow valve diaphragm and into the outflow valve shaft guide.

The pressure relief system contains a diaphragm assembly, pressure relief valve, and pressure relief adjustment screw.

2. OPERATION

A. General

Cabin air enters the reference chamber through the cabin air inlet orifice and filter connection and the pressure chamber through apertures around the base assembly and holes in the periphery of the outflow poppet valve and enters the pressure relief system through the cabin air sense port. Atmospheric pressure enters the pressure relief system through the true static atmosphere port and the atmosphere bleed port. The bottom face of the outflow poppet valve is also exposed to atmospheric pressure.

B. Cabin Pressure Relief

If the cabin-to-atmosphere pressure differential is more than calibrated limits, cabin air pressure must be reduced. With an increase in cabin pressure at the cabin air sense port, the cabin-to-atmosphere pressure differential across the diaphragm assembly increases. When the pressure differential reaches the calibrated pressure relief set point, the pressure relief valve unseats, this allows reference chamber air to flow to atmosphere, decreasing reference pressure. The cabin-to-reference pressure differential across the outflow valve diaphragm and outflow valve cover plate opens the outflow poppet valve, which allows cabin air to flow to atmosphere and thus reduces cabin pressure.

C. Cabin Vacuum Relief

If the discharge pressure is more than cabin pressure above calibrated limits, cabin air pressure must be increased. With an increase in discharge pressure, the discharge-to-cabin pressure differential across the outflow valve diaphragm opens the outflow poppet valve, which allows discharge pressure to enter the cabin increasing cabin pressure.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

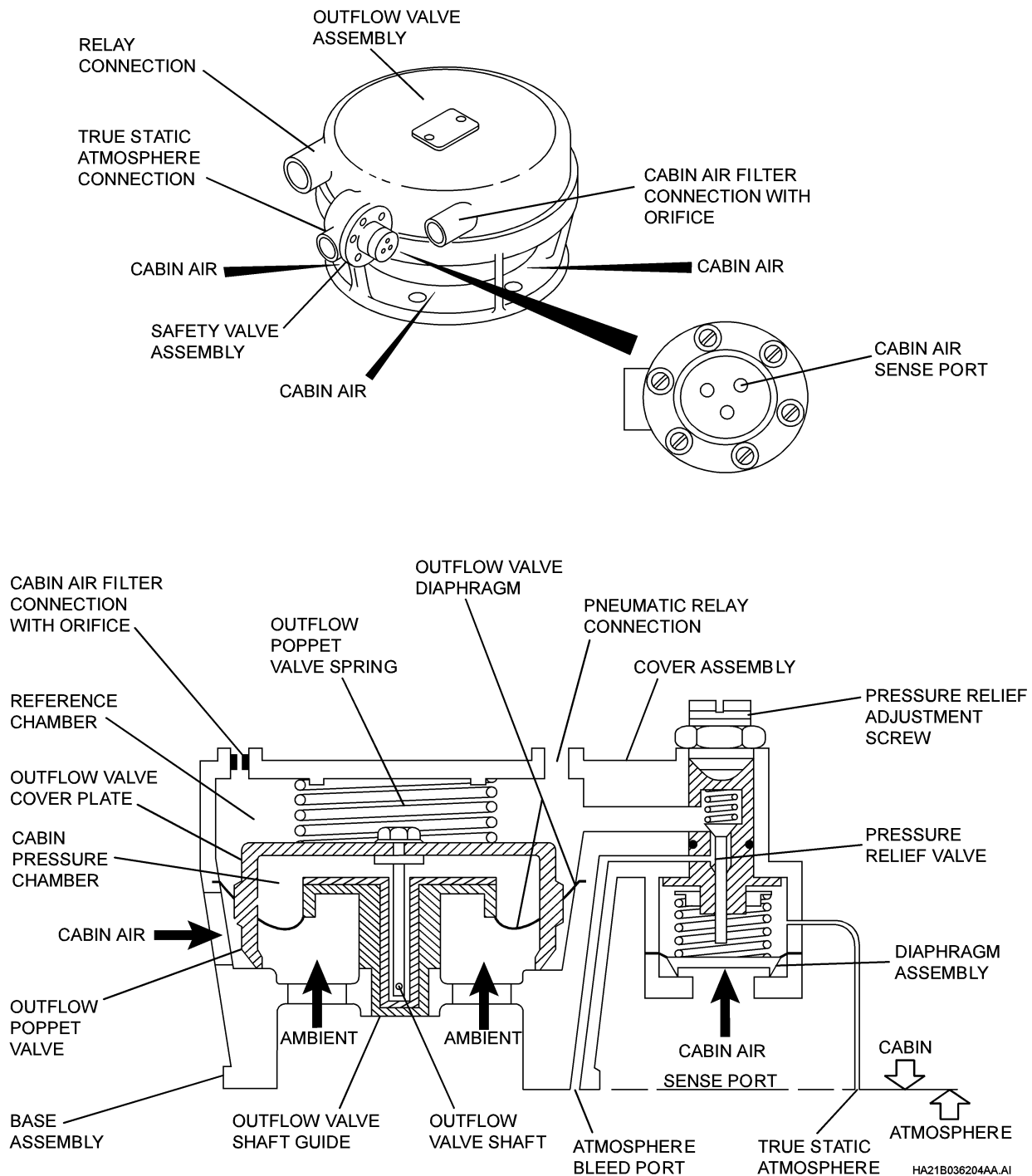


Figure 1
Outflow/Safety Valve

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

D. Cabin Dump

If it is desired to reduce cabin pressure to near atmosphere pressure, a manual cabin altitude control valve in the pneumatic relay connection is operated. Reference chamber air escapes to atmosphere, which reduces reference chamber pressure. The cabin-to-reference pressure differential across the outflow valve diaphragm and outflow valve cover plate opens the outflow poppet valve and allows cabin air to flow to atmosphere, this reduces cabin pressure to near atmosphere.

3. DATA

Pressure differential set point 8.65 ± 0.1 psi.

OUTFLOW/SAFETY VALVE - TROUBLE SHOOTING

Trouble	Probable cause	Remedy
Cabin fails to pressurize	Solenoid air valve open Filter clogged Excessive cabin leakage Inadequate air supply to cabin Foreign object between outflow poppet valve and seat Malfunction of associated cabin pressure control equipment Internal malfunction in outflow/safety valve	Close solenoid air valve Clean or replace filter Locate and seal cabin leaks Repair or adjust air supply equipment Clean outflow poppet valve and seat Correct malfunction of associated equipment Replace outflow/safety valve
Outflow/safety valve fails to relieve cabin air at proper pressure differential	Sensing lines loose, clogged or damaged Outflow poppet valve jammed or binding Pressure relief adjustment screw out of adjustment Internal malfunction in outflow/safety valve	Tighten, clean or replace sensing lines Replace outflow/safety valve Replace outflow/safety valve Replace outflow/safety valve
Outflow/safety valve leaks excessively	Foreign object between outflow poppet valve and seat Seating edge of outflow poppet valve damaged Base assembly damaged Internal malfunction in outflow/safety valve	Clean outflow poppet valve and seat Replace outflow/safety valve Replace outflow/safety valve Replace outflow/safety valve

OUTFLOW/SAFETY VALVE - REMOVAL/INSTALLATION

1. Outflow/Safety Valve

A. Removal

- (1) Get access to the cabin side of the rear pressure bulkhead.
- (2) Disconnect cabin air inlet pipeline from the valve.
- (3) Disconnect atmosphere bleed pipeline from the valve pressure relief valve.
- (4) Disconnect pneumatic relay pipeline from the valve.
- (5) Remove bolts securing the valve to the valve mounting flange, and remove valve and gasket.
- (6) If the valve is to be replaced, unscrew and remove pipe connections.
- (7) Blank off open pipeline and valve connections.

B. Installation

- (1) Remove all blanks.
- (2) If applicable, install pipe connections complete with nuts (where applicable) and packing, to the valve.
- (3) Assemble valve complete with gasket to mounting flange; connect valve to mounting flange with bolts and washers.
- (4) Connect cabin air inlet pipeline to the valve.
- (5) Connect atmosphere bleed pipeline to the valve pressure relief valve.
- (6) Connect pneumatic relay pipeline to the valve.
- (7) Wire-lock pipe connections and pipeline unions.
- (8) Electrically bond pipe lines, as applicable, using P-clips and bonding wire (Chapter 20, ELECTRICAL BONDING).
- (9) Install all equipment removed for access.

C. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.



OUTFLOW/SAFETY VALVE - ADJUSTMENT/TEST

1. Test

A. Procedure

- (1) Gain access to cabin side of opposite outflow/safety valve, disconnect true static atmosphere pipe on pressure relief valve. Blank pipe, do not blank pressure relief valve, this must be left open to cabin pressure.
- (2) Function test pressurization system (Chapter 21-30-00) and check operation of safety relief valve at maximum cabin differential pressure.
- (3) Remove blank and reconnect true static atmosphere pipe.
- (4) Refit any equipment removed for access.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING PRESSURIZATION CONTROL OUTFLOW/SAFETY VALVE CLEANING/PAINTING

1. INFORMATION

CAUTION: Extreme caution must be taken to prevent the cleaning solution from entering the valve's internal cavities. Therefore during cleaning of the assembled valve, all sense ports must be protected from solution ingestion.

Equipment/Materials	Part/Item No.
Cloth, lint free	621 (Ref. AMM 125/H-20, 20-95-201)
Cleaner, solvent	206 (Ref. AMM 125/H-20, 20-95-201)
Soap, mild	Local supply

2. CLEAN OUTFLOW POPPET VALVE

A. Procedure

- (1) Using a cloth (Item 621) soaked in solvent cleaner (Item 206) or mild soap, wipe the poppet valve and seat.

NOTE: To remove heavy contamination it may be necessary to soak the valve base in the cleaning fluid.

- (2) Use a cloth (Item 621) soaked in water and wipe the poppet valve and seat to remove any remaining contamination or cleaning solution.

PNEUMATIC RELAY - DESCRIPTION AND OPERATION

1. Description

The pneumatic relay consists of a two-piece housing, a relay diaphragm assembly, a relay calibration assembly, and a metering valve assembly incorporating a check valve.

The housing is separated into two chambers by the relay diaphragm assembly and contains three connections. The safety valve connection and the atmosphere connection are located in the safety valve reference pressure chamber. The control connection is located in the control reference pressure chamber.

The relay diaphragm assembly consists of a diaphragm and two diaphragm back-up plates riveted together. The diaphragm is secured between mating surfaces of the two-piece housing.

The relay calibration assembly consists of a spring retainer, a relay calibration spring, and a relay calibration screw. The relay calibration screw is threaded into the retainer, passes through the housing, and is secured with a locknut.

The metering valve assembly consists of a metering valve, a metering valve follow-up spring, a metering valve seat, and a check valve. The metering valve is held in constant contact with one of the diaphragm back-up plates by the metering valve follow-up spring. The check valve is held in position within the metering valve seat by a pin.

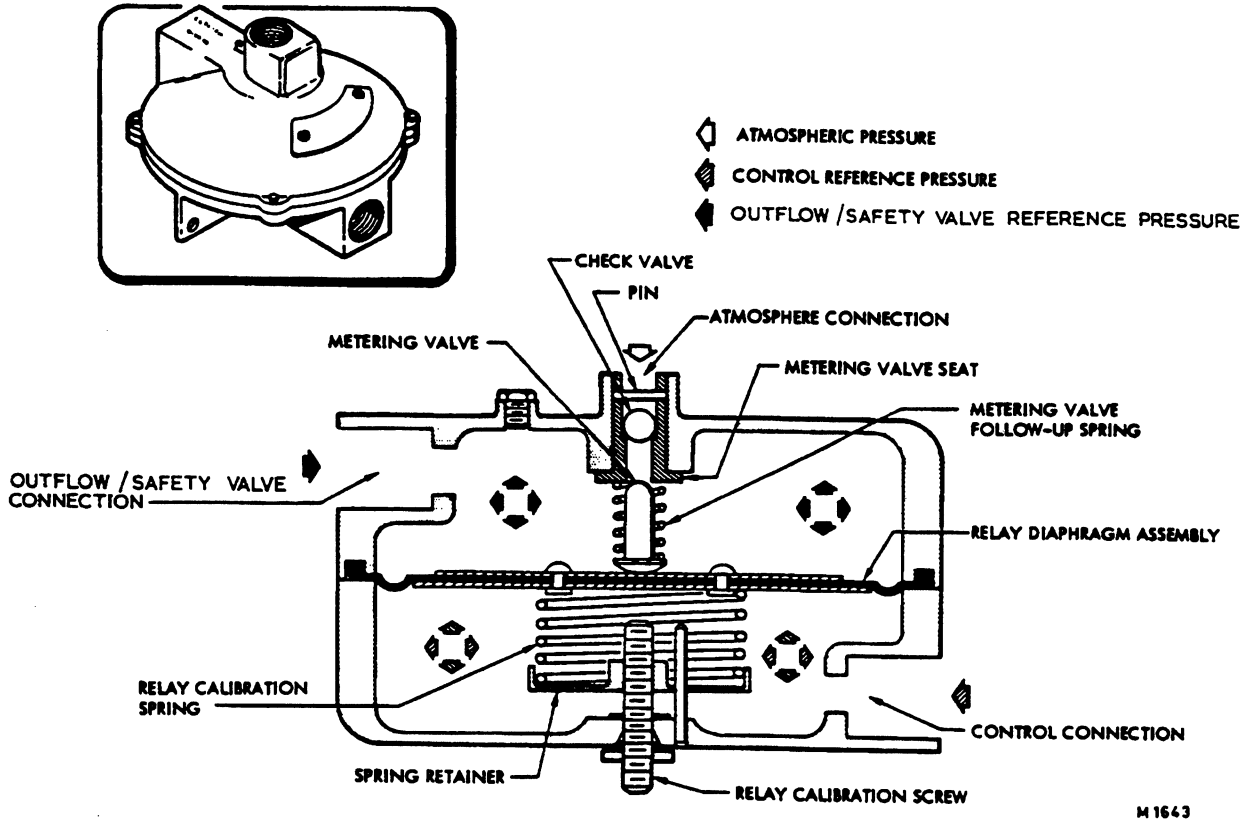
2. Operation *(Figure 1)*

In normal operation, two pressures are applied to the pneumatic relay : a control reference pressure from an outflow valve control, and atmospheric pressure. In addition, the safety valve reference chamber in the relay is connected to the reference pressure chamber of a safety valve.

Control reference pressure, established in an outflow valve control, is sensed in the relay through the control connection. Air from the reference pressure chamber in a safety valve flows into the relay through the safety valve connection. As cabin pressure increases, reference pressure in the safety valve and relay increases, creating a pressure differential across the relay diaphragm.

When this pressure differential (safety valve reference pressure to control reference pressure) increases sufficiently to overcome the force of the relay calibration spring, the relay diaphragm moves toward the calibration spring allowing the metering valve to open and modulate. The modulation of the metering valve controls the flow of safety valve reference pressure air to atmosphere which controls the safety valve reference pressure.

The check valve, located in the metering valve seat, prevents air from entering the safety valve reference pressure chamber through the atmosphere connection.



Pneumatic relay
Figure 1

EFFECTIVITY:

800XP

21-30-35

Page 2

July 95

PNEUMATIC RELAY - TROUBLE SHOOTING

Trouble	Probable cause	Remedy
Relay inoperative as indicated by improper safety valve action	Loose line or connection	Tighten line or connection
	Defective associated components	Replace associated components
	Defective relay	Replace relay
Operation of relay erratic as indicated by erratic operation of safety valve	Pneumatic connection leaking	Tighten pneumatic connection
	Defective associated components	Replace associated components
	Defective relay	Replace relay

PNEUMATIC RELAY - REMOVAL/INSTALLATION

1. Pneumatic Relay

A. Removal

- (1) Get access to the cabin side of the rear pressure bulkhead.
- (2) Disconnect atmosphere bleed pipeline from the relay.
- (3) Disconnect outflow/safety valve reference pressure pipeline(s) from the relay.

NOTE: The relay on the right side of the pressure bulkhead has a T-piece installed at its outflow/safety valve reference pressure connection to which the manual altitude control valve pipeline is connected.

- (4) Disconnect outflow/safety valve controller reference pressure pipeline from the relay.
- (5) Remove bolts that attach the relay to its mounting brackets, and remove the relay.
- (6) Remove pipe connections from the relay.
- (7) Install blanks to the relay and open pipelines.

B. Installation

- (1) Remove blanks from the relay and open pipelines.
- (2) Install pipe connections, complete with packing and attachment nuts as applicable, to the relay; do not tighten T-piece and elbow connections attachment nuts.
- (3) Position the relay and attach to mounting brackets with bolts, washers and nuts.
- (4) Position relay connections so that pipelines can be connected and tighten the connection attachment nuts.
- (5) Connect the atmosphere bleed pipeline to the relay connection.
- (6) Connect the outflow/safety valve controller reference pressure pipeline to relay connection.
- (7) Connect the outflow/safety valve reference pressure pipeline(s) to relay connection.
- (8) Wire-lock the relay connections and pipeline unions.
- (9) Electrically bond pipelines, as applicable, using P-clips and bonding wire (Chapter 20, ELECTRICAL BONDING).
- (10) Do a functional test of the pressurization system (PRESSURIZATION CONTROL).
- (11) Install the equipment removed during paragraph 1.A.(1).

C. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

AIR JET PUMP - DESCRIPTION AND OPERATION

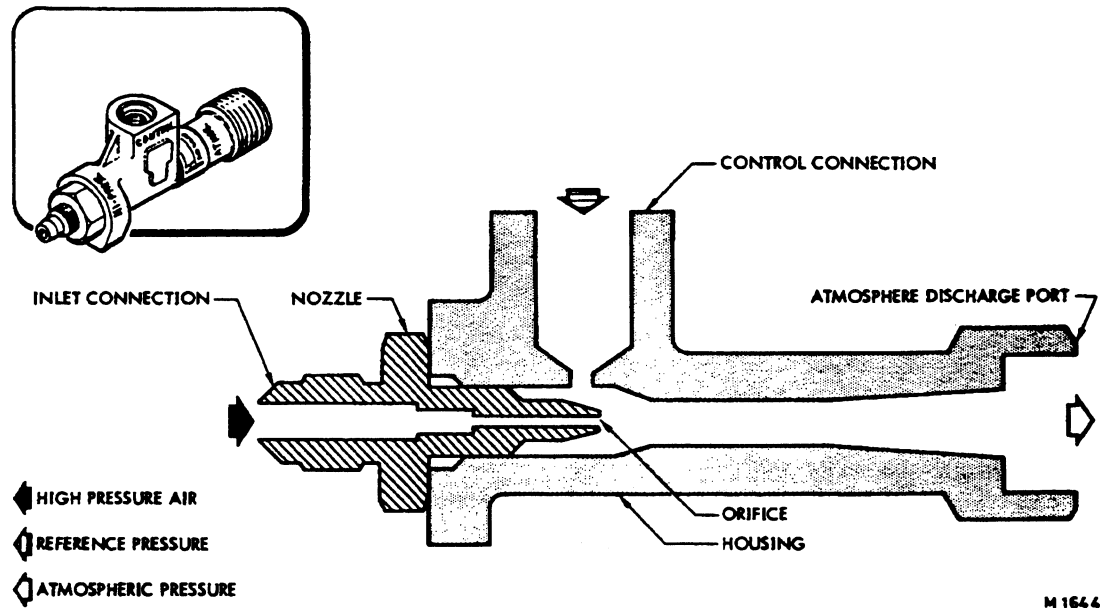
1. Description

The air jet pump has a housing with an integral venturi-shaped cavity and an inlet nozzle with an integral flow restriction orifice.

2. Operation

High-pressure air enters the high-pressure inlet connection and passes through the orifice to the atmosphere discharge port. Passage of air through the orifice and venturi-shaped cavity reduces the pressure at the control connection.

This reduced pressure is used to give a reference pressure lower than atmospheric pressure to other cabin pressurization components through the control connection.



Air jet pump
Figure 1

EFFECTIVITY:

800XP

21-30-45

Page 1

July 95



HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR JET PUMP - TROUBLE SHOOTING

Trouble	Probable Cause	Remedy
Insufficient vacuum at control connection	Loose connection at inlet connection	Tighten connection
	Obstructed line to inlet connection or from atmospheric discharge port	Remove obstruction
	Defective jet pump	Replace jet pump

EFFECTIVITY:

800XP

21-30-45

Page 101

July 95

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR JET PUMP - MAINTENANCE PRACTICES

1. Procedures

A. Removal

- (1) Get access to the cabin side of the rear pressure bulkhead.
- (2) Disconnect the high-pressure air inlet pipeline from the jet pump.
- (3) Disconnect the pipeline from the elbow at the jet pump control connection.
- (4) Unscrew the special-fitting nut that attaches the jet pump to the ambient port assembly, and remove the jet pump.
- (5) Remove the elbow connection from the jet pump control port.
- (6) Install blanks to the jet pump and the open pipelines.

B. Installation

Equipment/Materials	Part/Item No.
Leak testing solution	604 (Chapter 20-95-601)
Distilled water	Local supply

- (1) Remove blanks.
- (2) Install the elbow connection, complete with packing or O-ring seal as applicable, and locking nut, to the jet pump control port; do not tighten the locking nut.
- (3) Install a serviceable O-ring seal, engage the jet pump in the special fitting nut and attach by tightening the nut; safety the nut with lockwire.
- (4) Position the elbow so the pipeline can be connected to it, and tighten the elbow locking nut.
- (5) Connect pipeline to the elbow connection.
- (6) Connect the air inlet pipeline to the jet pump.
- (7) Safety the pipeline unions and pump connection with lockwire.
- (8) Electrically bond pipelines, as applicable, using P-clips and bonding wire (Chapter 20, ELECTRICAL BONDING).

C. Functional test

- (1) Start an engine (Chapter 71, POWER PLANT), and run at ground idle.
- (2) Use the leak testing solution (item 604) to make sure the high-pressure air inlet connection to the jet pump does not leak (Chapter 20, LEAK TESTING FLUID).
- (3) Shut down engine (Chapter 71, POWER PLANT).
- (4) Thoroughly wash off leak test solution with distilled water.

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (5) Install all equipment removed during paragraph 1.B.(1)

D. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING PRESSURIZATION CONTROL PRESSURE REGULATOR DESCRIPTION AND OPERATION

1. DESCRIPTION

The absolute air pressure regulator contains an evacuated capsule, poppet, and valve spring contained in a housing, and a housing cover. A cabin air pressure inlet and filter port is located in the housing, and a cabin air pressure outflow/safety valve discharge port is located in the housing cover.

The valve spring holds the poppet on its seat. The capsule is positioned to a calibrated setting by an adjustment screw set to open the poppet at the calibrated cabin air pressure.

2. OPERATION

Air at cabin pressure enters the regulator housing through a screened port, exerting pressure on the evacuated capsule. A valve spring forces the poppet against the valve seat. As cabin air pressure decreases to less than the calibrated setting of the regulator, the capsule expands, overcoming the spring force against the poppet and raising the poppet from the valve seat. With the poppet open, cabin air flows through the regulator to a safety outflow valve. As cabin air pressure increases beyond the calibrated setting of the regulator, the capsule contracts, allowing the valve spring force to seat the poppet, stopping air flow through the regulator.

3. DATA

Calibrated cabin air pressure (connected to outflow/safety valve):-

Pre-Mod. 25G173A - 13500 $\pm$ 1500 feet.

Mod. 25G173A - 11000 +1500 feet, -500 feet.

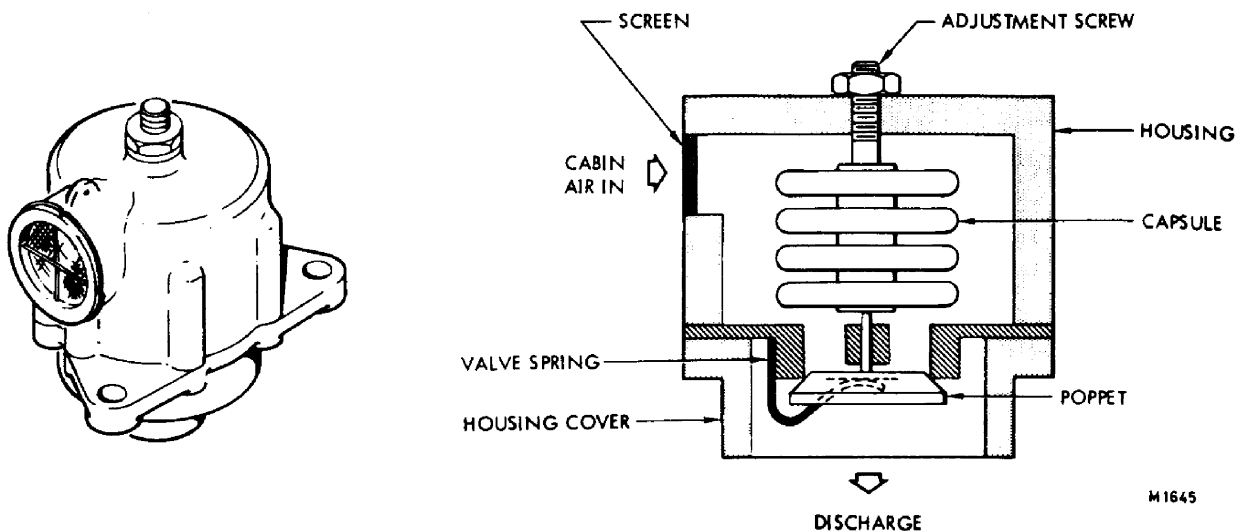


Figure 1
Pressure Regulator



HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

PRESSURE REGULATOR - TROUBLE SHOOTING

Trouble	Possible Cause	Remedy
Regulator inoperative	Filter screen clogged	Clean or replace filter screen
	Internal malfunction in regulator	Replace regulator

EFFECTIVITY:

800XP

21-30-55

Page 101

July 95

PRESSURE REGULATOR - MAINTENANCE PRACTICES

1. Unit servicing

A. Service filter screen

Equipment/Materials	Part/Item No.
Cleaning solvent	219 (Chapter 20-95-201)

- (1) Remove the filter screen from the regulator.

WARNING: USE DRY CLEANING SOLVENT IN A WELL VENTILATED AREA, AVOID INHALING FUMES, AND KEEP AWAY FROM FLAMES.

- (2) Clean the filter screen with cleaning solvent (Item 219) and dry thoroughly with compressed air.
- (3) Install the filter screen to the regulator.

B. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

2. Removal/Installation

A. Remove regulator

- (1) Get access to the cabin side of the rear pressure bulkhead.
- (2) Disconnect the pipelines from the T-piece connection or pipeline from pipe connection, as applicable.
- (3) Remove the bolts that attach the regulator to the mounting, and remove the regulator.
- (4) Remove the T-piece connection or pipe connection from the regulator.
- (5) Install blanks to the regulator and open pipeline(s).

B. Install regulator

- (1) Remove blanks and make sure the regulator filter screen is clean and undamaged.
- (2) Install the T-piece connection or pipe connection, as applicable, complete with nut and packing, or O-ring seal, as applicable, to the regulator; do not tighten nut.
- (3) Attach the regulator to the mounting with the attachment bolts.
- (4) Position the T-piece or pipe connection until the pipeline(s) can be connected, and tighten nut.
- (5) Connect the pipeline(s) to the T-piece or pipe connection and safety with lockwire.

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (6) Electrically bond pipelines, as applicable, using P-clips and bonding wire (Chapter 20, ELECTRICAL BONDING).
- (7) Install the equipment removed in paragraph 2.A.(I).

C. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

FAN OPERATED VENTURI - DESCRIPTION AND OPERATION

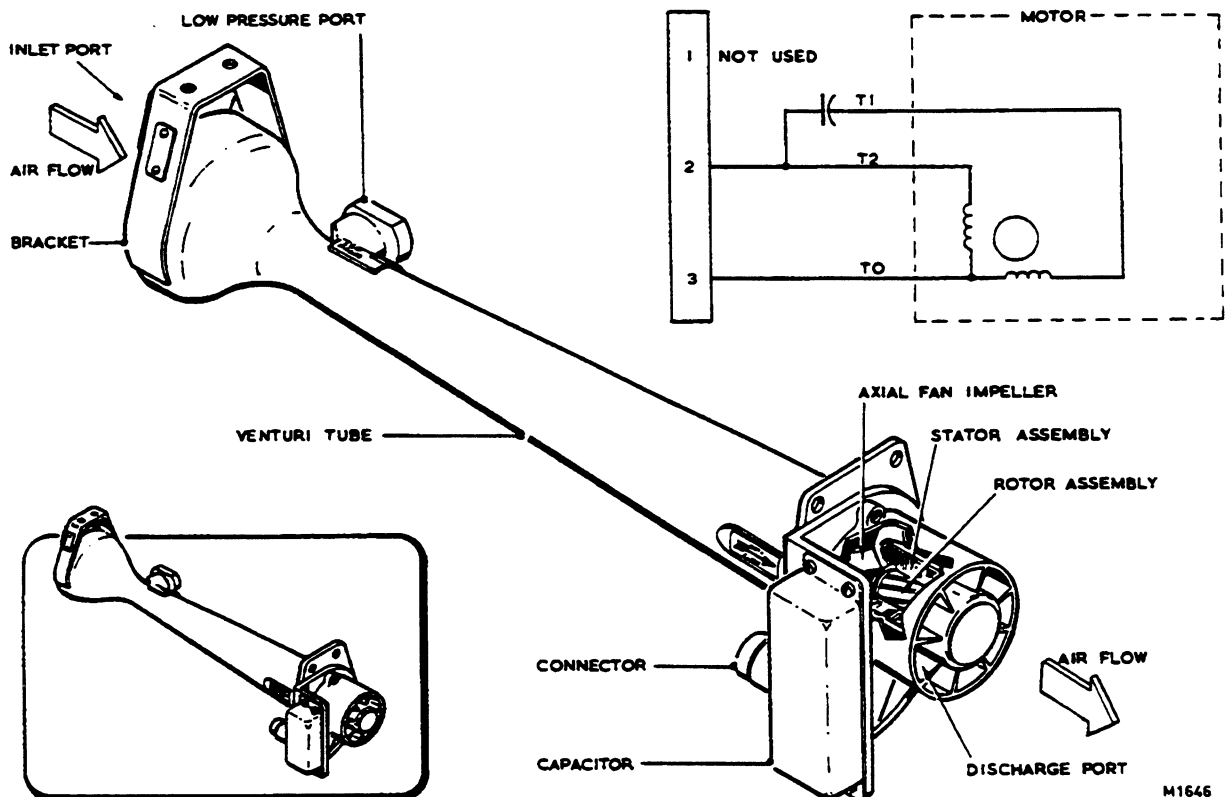
1. Description

The fan and venturi tube has a motor driven vane-axial fan, a capacitor, and a venturi tube assembly.

The motor-driven vane-axial fan has an alternating-current motor stator assembly, a rotor assembly, and a seven-bladed axial fan impeller attached to the rotor shaft. The rotor shaft is aligned by an annular ball bearing at each end. The complete assembly is contained within a vane-axial fan housing with eight vanes, and inlet and discharge ports.

The capacitor and the electrical connector are attached to a bracket. The bracket is positioned between the fan housing flange and the venturi tube flange.

The venturi tube assembly comprises a venturi tube, a low pressure port, and a bracket for attachment to the aircraft. The low pressure port consists of an internally-threaded boss brazed to the venturi tube throat. The attachment bracket is brazed to the venturi tube inlet end.



Fan operated venturi
Figure 1

EFFECTIVITY:

800XP

21-30-65

Page 1

July 95



HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

2. Operation

When voltage is applied at pins 2 and 3 of the electrical connector, the vane-axial fan rotates at high speed. An airflow is moved through the venturi tube, and the resultant pressure drop at the venturi tube throat is used as a low reference pressure for operation of other components of the pressurization system.

Airflow through the venturi tube cools the motor and discharges through the fan discharge port.

3. Data

Fan operating voltage	115 volts a.c., 400 cps, single phase.
Fan operating current	
Start	2.50 amp (max)
Run	0.70 amp (max)
Fan speed	22,200 rpm (min)
Fan rotation	Counter clockwise (viewed from fan inlet)

FAN OPERATED VENTURI - TROUBLE SHOOTING

Trouble	Probable Cause	Remedy
Unit fails to operate	Failure of power supply, or defective electrical connections	Restore power supply, check and repair electrical connections
	Defective unit	Replace unit
Unit current drain exceeds rated value as evidence by blown fuses or open circuit breakers	Excessive load due to restricted airflow	Check inlet and discharge ports; remove obstruction
	Defective unit	Replace unit
Incorrect pressure at low pressure port	Loose connections at low pressure port	Tighten connection
	Restricted airflow	Check inlet and discharge ports; remove obstruction
	Defective unit	Replace unit

FAN OPERATED VENTURI - REMOVAL/INSTALLATION

1. Fan Operated Venturi

A. Removal

- (1) Get access to the cabin pressure bulkhead.
- (2) On panel DA/D, open and safety tag the circuit breaker PRESSN VENTURI FAN (Chapter 24, ELECTRICAL POWER).
- (3) Disconnect the electrical plug from the venturi socket.
- (4) Disconnect the pipelines from the T-piece connection.
- (5) Remove the nuts, washers and bolts that attach the venturi to its mounting brackets, and remove the venturi.
- (6) Disconnect the T-piece connection from the venturi.
- (7) Install blanks to the venturi and pipelines.

B. Installation

- (1) Remove the blanks.
- (2) Install the T-piece connection complete with nut and O-ring seal to the venturi; do not tighten the nut.
- (3) Install the venturi to the mounting brackets with the bolts, washers and nuts.
- (4) Position the T-piece so the pipelines can be connected, and tighten the attachment nut.
- (5) Connect the pipelines to the T-piece connection.
- (6) Wirelock the T-piece connection and the pipeline unions.
- (7) Electrically bond pipelines, as applicable, with the P-clips and bonding wire (Chapter 20, ELECTRICAL BONDING)
- (8) Connect the electrical plug to the venturi socket.
- (9) Remove the safety tag and close the circuit breaker opened during removal.
- (10) Do a function test of the venturi fan (ADJUSTMENT/TEST).
- (11) When the furnishings are installed, make sure there is a minimum of 1 inch clearance between the fan venturi motor and the surrounding furnishings.
- (12) Install all equipment removed in paragraph 1.A.(1).

C. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

FAN OPERATED VENTURI - ADJUSTMENT/TEST

1. Functional test

A. Procedure

- (1) Energize d.c. busbars (Chapter 24, ELECTRICAL POWER).
- (2) Select No.1 or 2 INVERTER to START.
- (3) Select MAIN AIR VLV 1 switch to OPEN.
- (4) Select fan venturi PRESSN switch to AUTO and make sure the fan operates.
- (5) Select PRESSN switch to OVRD and make sure the fan stops.
- (6) Select PRESSN switch to AUTO.
- (7) Select MAIN AIR VLV 1 switch to CLOSE.
- (8) When No.1 main air valve is fully closed select and hold the left weight-on-wheels microswitch to the 'in-flight' position.
- (9) Select MAIN AIR VLV 1 switch to OPEN and make sure the venturi fan does not run.
- (10) Select MAIN AIR VLV 1 switch to CLOSE.
- (11) When No.1 main air valve is fully closed release the left weight-on-wheels microswitch to the 'on-ground' position and make sure the venturi fan operates for 18 to 22 seconds.
- (12) Select INVERTER to STOP.
- (13) De-energize d.c. busbars (Chapter 24, ELECTRICAL POWER).

B. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING PRESSURIZATION CONTROL CABIN PRESSURIZATION ALTITUDE WARNING SWITCH MAINTENANCE PRACTICES

1. INFORMATION

Equipment/Material	Part/Item No.
Barometric Pressure Switch Test Box and Adapter Harness.	101-384028/935
Vacuum Chamber, Ideal Aerosmith Inc.	16-11-2 or Equivalent
Air Data Test System, Sperry (now Honeywell).	ADT-222A, B or C.

2. REMOVAL/INSTALLATION

A. Removal

	MECH	INSP
(1) On panel DA-D, open, safety clip and tag the circuit breaker CABIN CTL (Ref. 24-01-00, 201)		
(2) On panel DA-A, release the four screws that attach the door. Carefully allow the door to drop open on it's hinge.		
(3) Inside panel DA-A, identify panel DA-H and the altitude warning switch ('SW') (and area above panel DA-C and switch ('AA') for Airplanes with Mod.259747C, SB 21-3136). NOTE Mod. 259747C (SB 21-3136) introduces a second altitude pressure switch (set to 14,000 ft.) to permit operation at high altitude airfields.		
(4) Remove the single screw that attaches the terminal block cover.		
(5) Identify and tag the terminal block wires, two wires on (-) and two wires on (+).		
(6) Remove the terminal screws. Disconnect the identified wires from the terminal block		
(7) Remove the three pan head bolts that attach the switch to panel DA-H (and to the area above panel DA-C Mod.259747C, SB 21-3136) and remove.		
(8) Attach the appropriate label to the altitude warning switch and place in a bag for protection.		
(9) Raise and fasten panel DA-A door.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

B. Installation

	MECH	INSP
(1) On panel DA-A, release the four screws that attach the door. Carefully allow the door to open on its hinge.		
(2) Inside panel DA-A, identify panel DA-H (and the area above panel DA-C if the Airplane has Mod.259747C, SB 21-3136). Use the three pan head bolts, removed in paragraph 2.A.(7), install the altitude warning switch ('SW') to panel DA-H (and switch ('AA') to area above Panel DA-C, Mod. 259747C, SB 21-3136).		
(3) Connect the wires, identified in paragraphs 2.A.(5) and 2.A.(6), to the relevant terminal block studs.		
(4) Install the terminal block cover.		
(5) Raise and fasten panel DA-A door.		
(6) On panel DA-D, remove the safety clips and tags and close the circuit breaker CABIN CTL opened in paragraph 2.A.(1).		

C. Close Up

	MECH	INSP
(1) Make sure that the work area is clean and clear of tools and other equipment.		

3. WARNING CIRCUIT TEST

A. Procedure

NOTE: This warning test can be performed with one or both altitude warning switches not installed in the airplane provided that the wires are properly safely located and protected.

- (1) Energize the airplane busbars (Ref. 24-01-00, 201).
- (2) To check the altitude warning circuit, make sure the flaps are up; push and hold the CABIN ALT TEST button on the overhead panel CG:
 - The MWS CABIN ALT annunciator comes "ON".
 - The MASTER WARN flashes.
 - The WARNING HORN sounds.
- (3) With the CABIN ALT TEST button still pushed held in, push the HORN ISOLATE button on the left hand throttle knob:
 - The WARNING HORN is canceled.
 - The MWS CABIN ALT stays "ON".
 - The MASTER WARN still flashes.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (4) Release CABIN ALT TEST button; all warnings cease.
- (5) Lower flap handle to 25 degrees, push and hold the CABIN ALT TEST button on the overhead panel 'CG'.
 - The MWS CABIN ALT annunciator comes "ON".
 - The MASTER WARN flashes.
 - The WARNING HORN sounds a short tone.
- (6) Release CABIN ALT TEST button; all warnings cease.
- (7) Raise flap handle to 0 degrees.
- (8) De-energize the airplane busbars (Ref. 24-01-00, 201).

NOTE: A full functional test of the altitude warning switches can only be done in the calibration bay as follows:

- For altitude warning switches P/N 1103KSDBU* series refer to CMM 31-09-194/51 - Smiths OVERHAUL MANUAL FOR ALTITUDE SWITCHES.
- For altitude switch P/N 140-380024-XX and Eaton 214C40-2-XX, refer to paragraph 4.A.

4. CABIN PRESSURIZATION ALTITUDE WARNING SWITCH P/N 140-380024-XX AND EATON 214C40-2-XX, FUNCTIONAL TEST

A. Test Procedure

Action	Result
(1) Turn on the Air Data Test System (ADTS) and allow for proper warm up as per the manufacturers instructions.	-
(2) Connect the static port of the ADTS to the Vacuum Chamber.	-
NOTE Up to four switches may be connected to the adapter harness.	
(3) Connect the switch(es) to the adapter harness and then plug the adapter harness connector to the receptacle inside the vacuum chamber. Orient the switches so that the contacts are positioned at the side of the switches and not at the top.	-
(4) Make sure the pressure chamber is properly sealed and connect the switch test box to the connector on the back of the pressure chamber.	-

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

Action	Result
(5) Energize the adapter harness from a 28 Vd.c. power supply	-
(6) Increase the vacuum in the chamber equivalent to the altitude values shown in Table 201. When approaching the expected trip point (minus tolerance) the rate should not exceed 460 ft./min.	At altitude, the green lights will illuminate within the altitude tolerance specified.
(7) Reduce vacuum in the chamber equivalent to the altitude value shown in Table 201. When approaching the expected trip point the rate should not exceed 460 ft./min.	The green lights will go off within the altitude tolerance specified.
(8) Return the chamber to ambient pressure.	-
(9) De-energize the adapter harness.	-
(10) Disconnect the switch(es) on test from the adapter harness.	-
(11) Disconnect the adapter harness connector from the vacuum chamber and remove the harness adapter from the chamber.	-
(12) Disconnect the switch test box.	-

Table 201
Altitude Warning Switch Trip Points

Part Number	Increasing Altitude	Decreasing Altitude
140-380024-1 & -7 (214C40-2-57 & -80)	9300 ± 300 ft.	7358 ft. minimum
140-380024-5 & -11 (214C40-2-59 & -82)	14,000 ± 300 ft.	11,756 ft. minimum

GROUND PRESSURE TEST VALVE - REMOVAL/INSTALLATION

1. Ground Pressure Test Valve

A. Removal

- (1) Remove Captain's right console side panel.
- (2) Disconnect pipelines from the valve.
- (3) Remove bolt and withdraw valve operating lever.
- (4) Remove bolts securing valve to console and remove valve, and packing if fitted.
- (5) Remove straight connections from the valve.
- (6) Fit blanks to valve and pipelines.

B. Installation

- (1) Remove blanks.
- (2) Install straight connections, complete with locknuts and O-ring seals, to the valve.
- (3) Close valve.
- (4) Position valve and packing, if applicable, and secure to console using bolts.
- (5) Connect pipelines to valve connections.
- (6) Wire-lock pipeline unions and valve connections.
- (7) Attach operating lever to the valve, the lever is keyed to the valve and may be shimmed (max 0.05 in.); tighten the lever securing bolt.
- (8) Functionally test pressurization system (Chapter 21, PRESSURIZATION CONTROL).
- (9) Install Captain's console side panel.

CABIN TRIPLE INDICATOR - DESCRIPTION AND OPERATION

1. Description

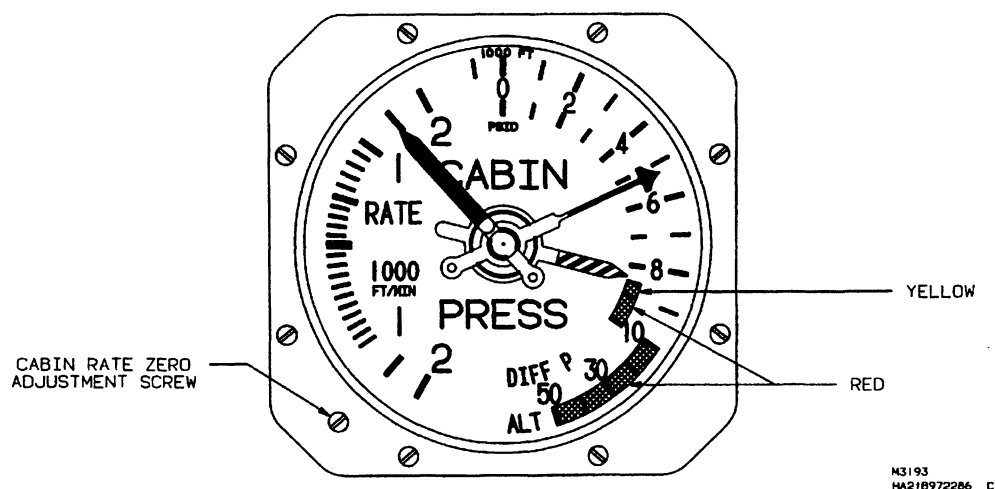
The cabin triple indicator, which is located in the cockpit on the co-pilot's instrument panel (CD) provides a display of three parameters relative to cabin pressurization.

- The rate of change of the cabin altitude in feet per minute (ft./min) in climb or descent (calibrated range 2000 ft./min UP and DOWN).
- The differential pressure between the cabin pressure and the outside ambient pressure in pounds per square inch (psi) (calibrated range up to 10.5 psi).
- The cabin altitude expressed in feet (calibrated range up to 50,000 feet).

The completely pneumatic mechanism receives inputs of cabin pressure and aircraft static pressure. The airplane static pressure is tapped from the S9 static line. Three mechanism assemblies, consisting of three individual pneumatic diaphragms (capsules), are combined in one instrument case to display information on three independent pointers against a common instrument dial face.

Presentation of the triple indicator is in a standard three-inch dial format. The dial is divided in half vertically, providing two scales. On the right side is the altitude read-out in thousands of feet and the cabin pressure in pounds per square inch. The altitude and differential pressure pointers are distinguished by differences in shape and length. The altitude scale has a red warning band between 10,000 and 50,000 ft. to show the cabin is at a dangerous altitude. The cabin pressure range has a yellow band ranging from 8.5 psi to 8.65 psi and a red band from 8.65 psi to 10.5 psi which corresponds to the airplane's maximum pressurization point. The left half of the dial, which has a single pointer, shows cabin pressure change rate calibrated in thousands of feet by increments of 200 feet.

There is a 5.0 volt d.c. supply for internal indicator lighting.



Cabin triple indicator

Figure 1

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING PRESSURIZATION CONTROL CABIN TRIPLE INDICATOR REMOVAL/INSTALLATION

1. INFORMATION

NOTE: For electrical connections in the lighting circuit refer to Airplane Electrical Chart No. 25-8NA5-*12C.

2. CABIN TRIPLE INDICATOR

A. Removal

	MECH	INSP
(1) Make sure electrical power is removed from the 5.0 volt d.c. lighting circuit.		
(2) At the right instrument panel (CD) locate and identify the cabin triple indicator.		
(3) At the rear of the indicator, disconnect the static pressure line. Install a blank to the airplane static line.		
(4) Disconnect the 5.0 volts d.c. lighting circuit from the rear of the indicator by the method that follows: (a) Find the two in-line connectors. (b) Disconnect the wires with the applicable insert/extract tool.		
(5) Remove the four attachment screws and withdraw the indicator from the rear of the instrument panel.		
(6) Install blanks to all the indicator orifices.		

B. Installation

	MECH	INSP
(1) Remove the blanks from the indicator.		
(2) From the rear of instrument panel (CD), attach the indicator using the four screws removed in paragraph A.(5).		
(3) Remove the blank from the airplane static line and connect to the indicator.		

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(4) Connect the two indicator 'fly-leads' to the airplane 5.0 volt d.c. lighting circuit by the method that follows: (a) Find the two in-line connectors. NOTE Make sure each of the two wires is connected into the circuit correctly - red to red and black to black. (b) Install the wires with the applicable insert/extract tool.		
(5) Reinstate the electrical power to the lighting circuit. Make sure the internal indicator lighting comes on.		
(6) Do a leak test on the S9 static pressure system. (Ref. 34-11-19, 501).		

C. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

MANUAL CABIN ALTITUDE CONTROL VALVE - DESCRIPTION AND OPERATION

1. Description

The air needle valve consists of an outer housing with air inlet and outlet connections, and adjustment knob, and a valve shaft. The valve shaft is turned by the knob to seat a needle valve. The needle valve is spring-loaded inside the bottom end of the shaft by a compression spring.

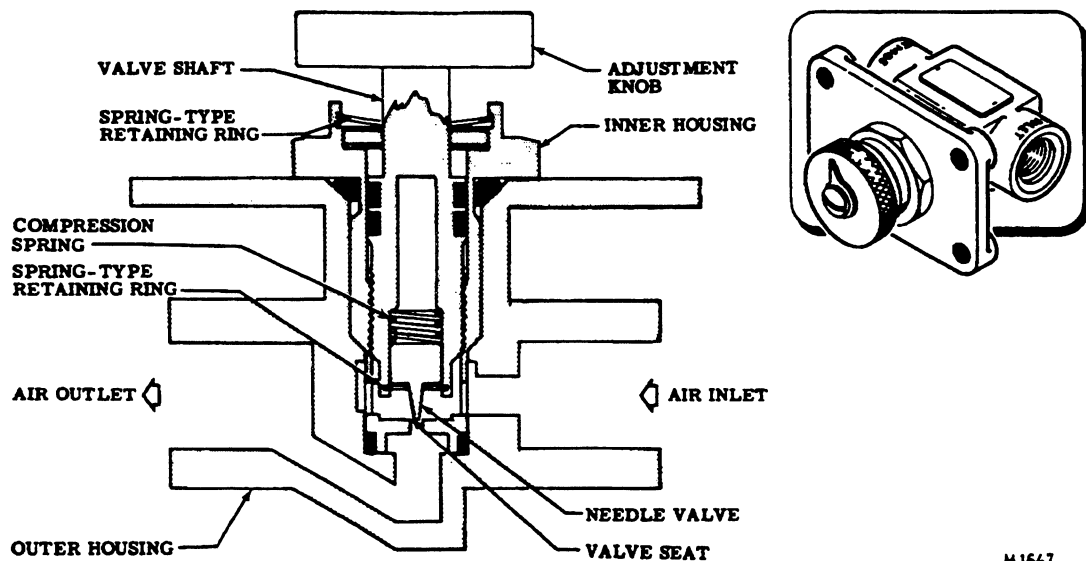
The needle valve is retained inside the valve shaft by a spring-type retaining ring. The valve shaft is retained inside the inner housing by a spring-type retaining ring.

2. Operation

As the valve is opened, air enters the inlet connection in the side of the valve housing and flows through the valve seat opening and out the atmosphere connection.

The valve is operated by turning the knob on top of the valve counter-clockwise to open the valve. To open the valve fully from the closed position requires approximately seven complete turns. A pointer on top of the knob gives indication of internal valve position. The pointer is 90 to 105 degrees counter-clockwise from the inlet connection when air begins to flow through the valve.

Further clockwise rotation of the valve shaft, after the valve is seated, compresses the spring in the end of the valve shaft; this prevents manual jamming of the valve on its seat.



M1647

Manual cabin altitude control valve
Figure 1

MANUAL CABIN ALTITUDE CONTROL VALVE - TROUBLE SHOOTING

Trouble	Probable Cause	Remedy
Valve binds during rotation	Valve threads galling	Replace valve
No airflow through valve when opened	Valve clogged with foreign material	Clean valve ports and passages
	Needle valve remains seated because of broken or unseated retaining ring	Replace valve
	Insufficient air supply	Make sure proper supply of air to valve

MANUAL CABIN ALTITUDE CONTROL VALVE - REMOVAL/INSTALLATION

1. Control Valve

A. Removal

- (1) Remove the pilots' right console side panel.
- (2) Disconnect the pipelines from the control valve.
- (3) Remove the bolts that attach the valve to the console, and remove the valve and packing, if installed.
- (4) Remove the straight connections from the valve.
- (5) Install blanks to the valve and open the pipelines.

B. Installation

- (1) Remove the blanks.
- (2) Install the straight connections, complete with locknuts and O-ring seals to the control valve.
- (3) Put the valve in position so the venturi pipeline connects to the valve ATMOS connection, and the outflow/safety valve reference chamber pipeline to the valve INLET connection. Install packing, if applicable, and attach the valve to the console with the bolts.
- (4) Connect the pipelines to valve connections.
- (5) Wirelock the pipeline unions and valve connections.
- (6) Do a function test of the pressurization system (PRESSURIZATION CONTROL).
- (7) Install the console side panel.

C. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

VENTURI - DESCRIPTION AND OPERATION

1. Description

The air flow venturi consists of a venturi assembly and a protective screen assembly.

The venturi assembly is an aluminium casting with a passage that starts at the cabin air-in port and tapers sharply to a narrow neck, where there is a small opening to the low-pressure port. The passage then gradually increases in diameter to the ambient pressure port. The ambient pressure port is externally threaded, and the low-pressure port is internally threaded. The cabin air-in port provides a means of mounting the protective screen assembly to the venturi assembly.

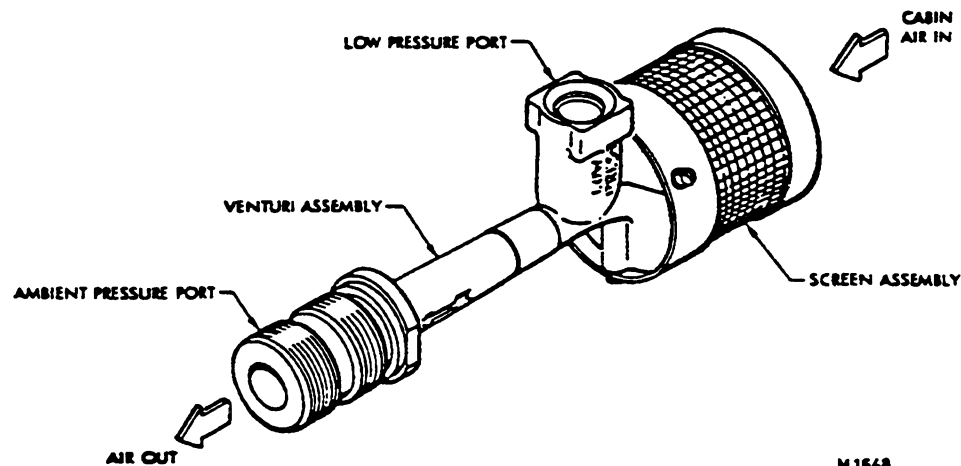
The protective screen assembly consists of a square-mesh wire-screen basket with a flange for mounting.

2. Operation

Air flowing through the venturi from the cabin air-in port to the ambient pressure port provides a pressure at the low pressure port that is less than cabin air pressure.

3. Data

Minimum pressure differential below cabin pressure with cabin
to ambient pressure differential of 3.70 in. of water. 12 in. of water.



Venturi
Figure 1

EFFECTIVITY:

800XP

21-30-105

Page 1

July 95



HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

VENTURI - TROUBLE SHOOTING

Trouble	Probable Cause	Remedy
Insufficient vacuum at low pressure port	Loose connection at low pressure port	Tighten connection
	Obstructed screen assembly	Remove obstruction
	Obstructed venturi assembly	Remove obstruction

EFFECTIVITY:

800XP

21-30-105

Page 101

July 95

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

VENTURI - REMOVAL/INSTALLATION

1. Venturi

A. Removal

- (1) Disconnect pipeline from elbow connection at the venturi low-pressure port.
- (2) Loosen the locknut and remove the venturi from adapter.
- (3) Remove elbow connection from the venturi.

B. Installation

- (1) Install elbow connection, complete with locknut and packing, to the venturi; do not tighten locknut.
- (2) Install the venturi, complete with locknut and packing, to the adapter; do not tighten locknut.
- (3) Position venturi and elbow so that the pipeline can be connected, then tighten elbow connection and venturi attachment locknuts.
- (4) Connect pipeline to elbow connection.
- (5) Wirelock the venturi, the elbow connection attachment nuts and the pipeline union.

C. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

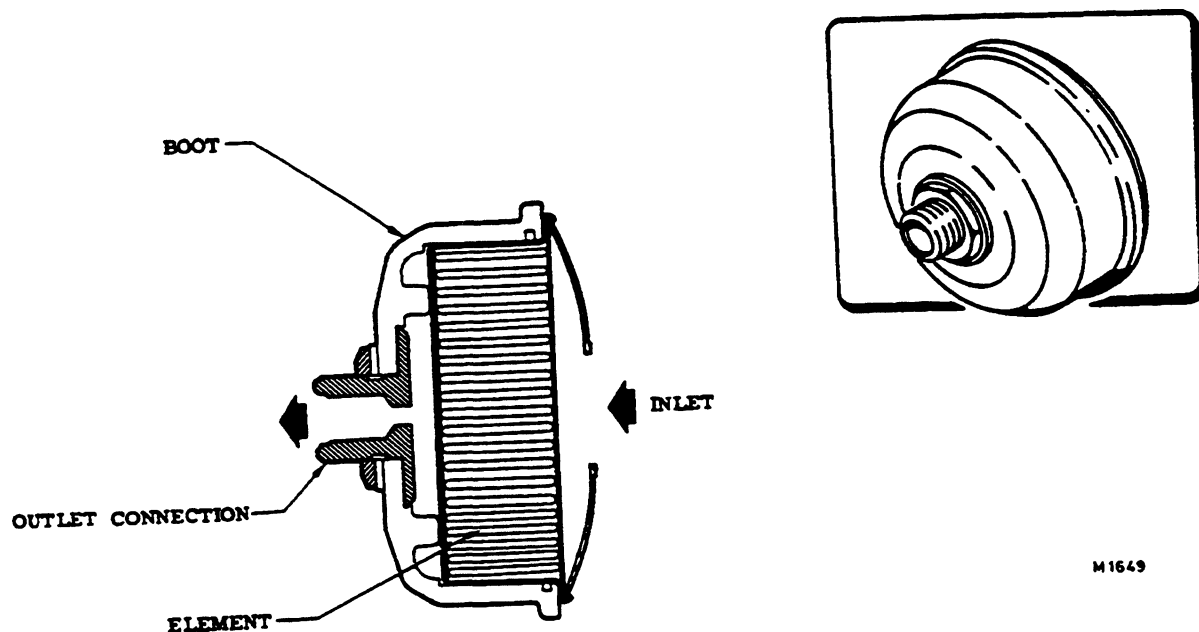
CABIN AIR FILTER - DESCRIPTION AND OPERATION

1. Description

The air filter consists of a casing (boot) filter element cartridge, and an outlet connection. The filter cartridge consists of a filter element and a nylon screen.

2. Operation

Air enters the filter and passes through the filter element and nylon screen. The nylon screen prevents large particles of foreign matter from entering the cabin air sensing port. The filter element prevents fine particles of foreign matter and tobacco tars from entering the cabin air sensing port.



Air filter
Figure 1

EFFECTIVITY:

800XP

21-30-115

Page 1

July 95

CHECK VALVE - DESCRIPTION AND OPERATION

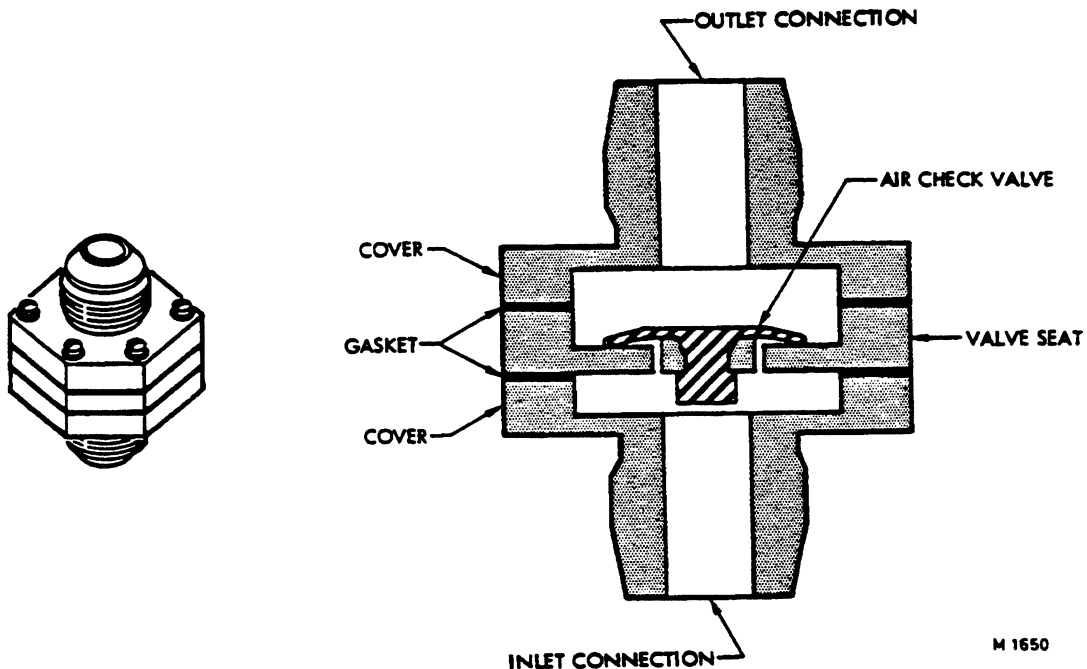
1. Description

The check valve contains an air check valve, valve seat, gaskets, and two covers. The air check valve is attached to the centre of the valve seat with the seating surface of the air check valve contacting the valve seat.

2. Operation

When the pressure differential across the valve reaches the calibrated value, the air check valve is lifted off the valve seat, allowing airflow through the valve.

If the pressure differential across the valve is reversed, airflow is prevented by the pressure holding the air check valve on the valve seat.



Check valve
Figure 1

EFFECTIVITY:

800XP

21-30-125

Page 1

July 95

DUMP VALVE AND CONTROL MECHANISM - REMOVAL/INSTALLATION

Equipment/Materials	Part/Item No.
Sealing compound	316 (Chapter 20-95-301)

1. Removal *(Figure 401)*

A. Procedure

- (1) Remove flight compartment right-hand seat from rails (Chapter 25, FLIGHT COMPARTMENT) and remove inboard floor panel.
- (2) Disconnect connecting rod from valve operating lever arm.
- (3) Slacken hose clips at inlet end of valve and slide pipe connector along inlet duct to clear valve.
- (4) Remove bolts securing valve to outlet duct flange and remove valve.

2. Checks/Tests before installation

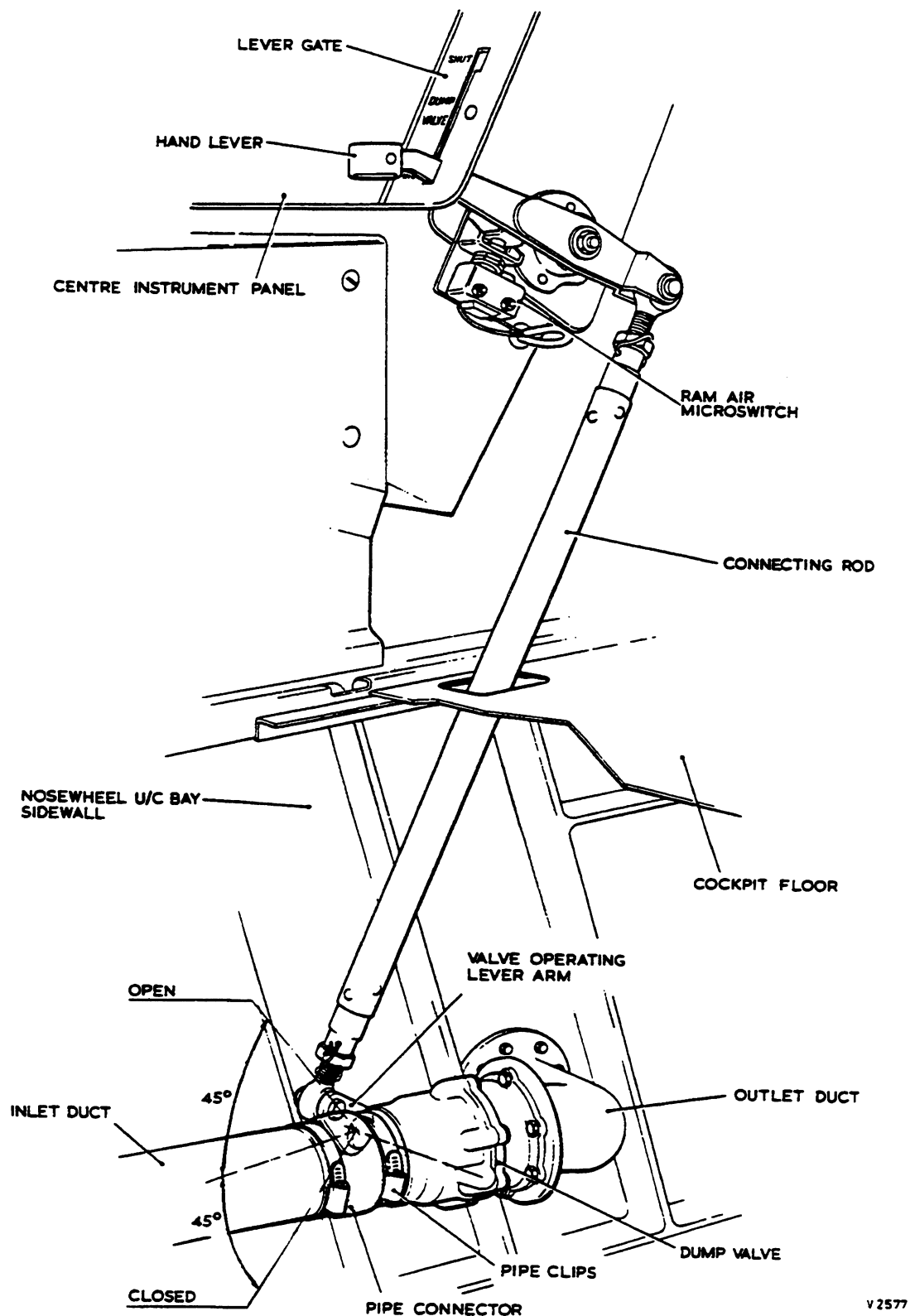
A. Procedure

- (1) Check that operating lever arm is fitted to valve spindle hexagon so that lever movement is 45° either side of valve axis and that lever is pointing toward inlet end of valve.
- (2) Check that valve operating lever arm is firmly secured with washer and nut.
- (3) Clean mating surfaces of valve and outlet duct flange and apply the sealing compound (item 316) (Chapter 20-10-1002).

3. Installation *(Figure 401)*

A. Procedure

- (1) Position valve flange on outlet duct flange and fit securing bolts.
- (2) Fit pipe connector over inlet end of valve and inlet duct and secure using hose clips.
- (3) Attach connecting rod to valve operating lever arm.
- (4) Adjust connecting rod as necessary to make sure that with the hand lever in the SHUT position the valve is fully closed and that there is a full range of movement to the OPEN position. Check rod ends are in safety, tighten locknuts and wire-lock.
- (5) Operate hand lever between SHUT and OPEN position, and check for full and free movement. Return lever to SHUT position.
- (6) Fit inboard floor panel and right-hand seat (Chapter 25, FLIGHT COMPARTMENT).



Dump valve removal and installation
Figure 401

EFFECTIVITY:

800XP

21-30-136

Page 402

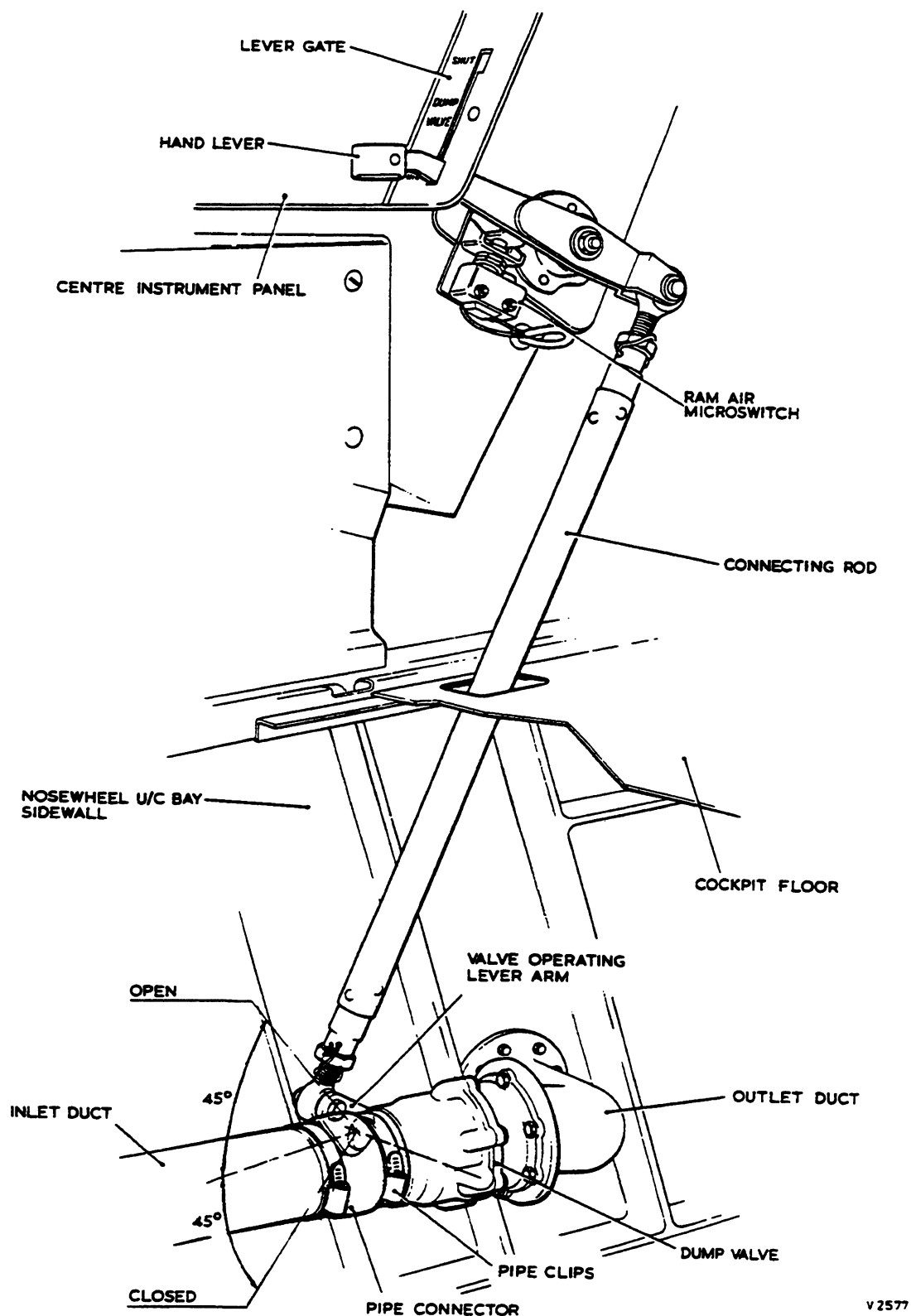
July 95

DUMP VALVE AND CONTROL MECHANISM - ADJUSTMENT/TEST

1. Adjust ram air valve microswitch (operated by dump valve lever) (*Figure 501*)

A. Procedure

- (1) With dump valve lever in the OPEN (down) position, adjust microswitch on its bracket until its plunger just touches the stop (angle bracket).
- (2) Insert 0.10 in. thick packing piece between the switch plunger and the stop.
- (3) Adjust switch towards the stop (upwards) until all the plunger overtravel is taken up, and lock microswitch in this position.
- (4) Remove the packing pieces.



V 2577

Dump valve removal and installation
Figure 501

EFFECTIVITY:

800XP

21-30-136

Page 502

July 95

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING

TEMPERATURE CONTROL DESCRIPTION AND OPERATION

1. DESCRIPTION

The cabin temperature control system automatically regulates the cabin air temperature or cabin air supply temperature to a value selected by the crew (Ref. Figure 1 and Figure 2).

In operation, the temperature controller receives:

- Temperature sensor signals from the duct temperature sensor and the cabin temperature sensor.
- A true/false over-temperature condition from the duct over-temperature switch.
- Crew selected setting information from the AUTO/MANUAL switch mounted on roof panel CG.

The controller responds to these inputs by controlling the cabin temperature control valve as follows:

- In AUTO mode, the duct temperature sensor signal is used to keep the duct air temperature between $30 \pm 4^\circ$ and $150 \pm 5^\circ$ F (-1.1° and 65.6° C) depending on the position of the switch.
- With a low-limit temperature sensor signal of 36° F (2.2° C), Pre-Mod.25G039A or 41° F (5° C), Mod.25G039A, and the switch in the minimum 'cool' position, supply air can be achieved for most ambient conditions. For very hot, humid ambient conditions with low bleed pressures going in to the environmental control unit (ECU), 36° F (2.2° C), Pre-Mod.25G039A or 41° F (5° C), Mod.25G039A, supply air in to the cabin may not be possible and a higher supply temperature results. For these conditions both the cabin temperature control valve and the low-limit temperature control valve are fully closed.
- On very cold days with low bleed pressure and temperatures (e.g. engine at ground idle), the ECU supply air may not achieve 155° F (68.3° C) and a lower temperature is all that is thermodynamically possible. For this condition, the cabin temperature control valve is fully open.
- In AUTO mode, the cabin temperature sensor provides feedback to keep the cabin temperature at the crew selected value between 65° and 90° F (18.3° and 32.2° C).

NOTE: The ECU may not be able to thermodynamically achieve 65° F (18.3° C) on hot humid days or 90° F (32.2° C) on cold days with low engine bleed pressures and temperatures.

- In AUTO and MANUAL modes, the duct over-temperature switch provides a high temperature limit control at $222 \pm 10^\circ$ F ($105.6 \pm 5.6^\circ$ C) by operating a duct limit relay to close the cabin temperature control valve and switch on an amber DUCT OVHT annunciator on the MWS panel. When the supply air temperature drops to an acceptable level, the system resets to normal and the amber annunciator is switched off.
- The crew can select either the AUTO or MANUAL mode of operation on the switch. In AUTO, the crew can select a setpoint temperature between 65° and 90° F (18.3° and 32.2° C) and the cabin will be kept automatically at the selected temperature. In MANUAL, the crew can manually select the cabin temperature control valve to any position from fully closed to fully open.

Automatic temperature control can be overridden by moving the AUTO/MANUAL switch through a detent to the spring loaded, centre off, MANUAL position. Operation of the cabin temperature control valve is then achieved by holding the switch to COOL or HOT, as required.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

When the AUTO/MANUAL switch is released to the centre off position, the cabin temperature control valve is held in the attained position by integral magnetic brakes. The duct temperature is monitored to make sure that the required setting has been achieved. The duct temperature limiter continues to operate in the MANUAL mode.

The temperature of the air supply to the flight compartment can be varied by the F/DK VLV OPEN-CLOSE switch. Holding the switch to OPEN for ten seconds fully opens the auxiliary heating valve. With the valve fully or partly open, hot air is supplied directly from No.2 engine to the heat augmentor (if fitted). At the heat augmentor, the hot air mixes with the normal flight compartment supply and raises the temperature. Selecting CLOSE causes the valve to run to the closed position and the flight compartment receives air only at the controlled cabin temperature.

2. OPERATION

A. Auto

With busbars PS2 and PE energized and the AUTO/MANUAL switch selected to AUTO, supplies are directed to the cabin temperature controller and the cabin temperature sensor fan.

If the cabin temperature is at a value corresponding to the setting of the temperature selector, the cabin control bridge is in balance and there is no output from the cabin temperature controller. If the cabin temperature is different from the temperature selected, the cabin control bridge is unbalanced and an error is produced which is applied to the programming amplifier. Due to the bridge resistance value tolerance, cabin temperature variations may vary slightly between airplanes for given selector settings.

If the error output is due to low cabin temperature, the controller produces a heat demand output, which activates the cabin temperature control valve. Valve movement stops when the cabin temperature sensor restores the balance of the cabin control bridge.

If the error output is due to high cabin temperature, the controller produces a cool demand output and closes off the cabin temperature control valve.

The relevant temperature control trigger, timing and feedback circuits, provide a continuous demand output if there is a large error between cabin and selected air temperature. This provides a rapid re-positioning of the valve. As the error decreases, the timing and feedback circuits cause the demand output to be pulsed, reducing the rate of valve movement. The ratio of on-time to off-time of the output pulses decreases proportionately as the error signal decreases until the valve gets to its final position. At this point the control bridge is once more in balance.

The duct control bridge functions as high and low temperature limiters and provides signals which override cabin control bridge signals.

B. Manual

When busbar PE is energized and the AUTO/MANUAL switch pointer is in the MANUAL arc, the cabin temperature controller is made inoperative. Selection of HOT or COOL activates the cabin temperature control valve. Progressive movement of the control is obtained by selecting HOT or COOL for short periods only. Releasing the switch stops valve movement.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

C. System Overheat

If the temperature of the air in the main supply duct reaches approximately $222 \pm 10^{\circ} \text{ F}$ ($105.6 \pm 5.6^{\circ} \text{ C}$), the duct over-temperature switch contacts close and complete the circuit to the duct limit relay energizing coil and the (MWS) DUCT OVHT annunciator. With the relay energized, a supply is fed to the 'close' field of the cabin temperature control valve, which motors towards the closed position.

When the duct temperature is lowered below the duct-temperature switch setting, the duct limit relay is de-energized and normal control is restored. The DUCT OVHT annunciator goes off.

D. Air Initiated Starting

To provide consistent starting of the air cycle machine (ACM) at the air initiation, the cabin temperature control valve is driven to the closed position when all air supply valves (MAIN AIR VALVE 1, MAIN AIR VALVE 2 and APU BLEED AIR) are closed. The cabin temperature control valve will open only when one of the air supply valves reaches its fully open position and, in the case of the APU, an APU ready signal is received within 10 seconds and when 90% rpm is reached.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

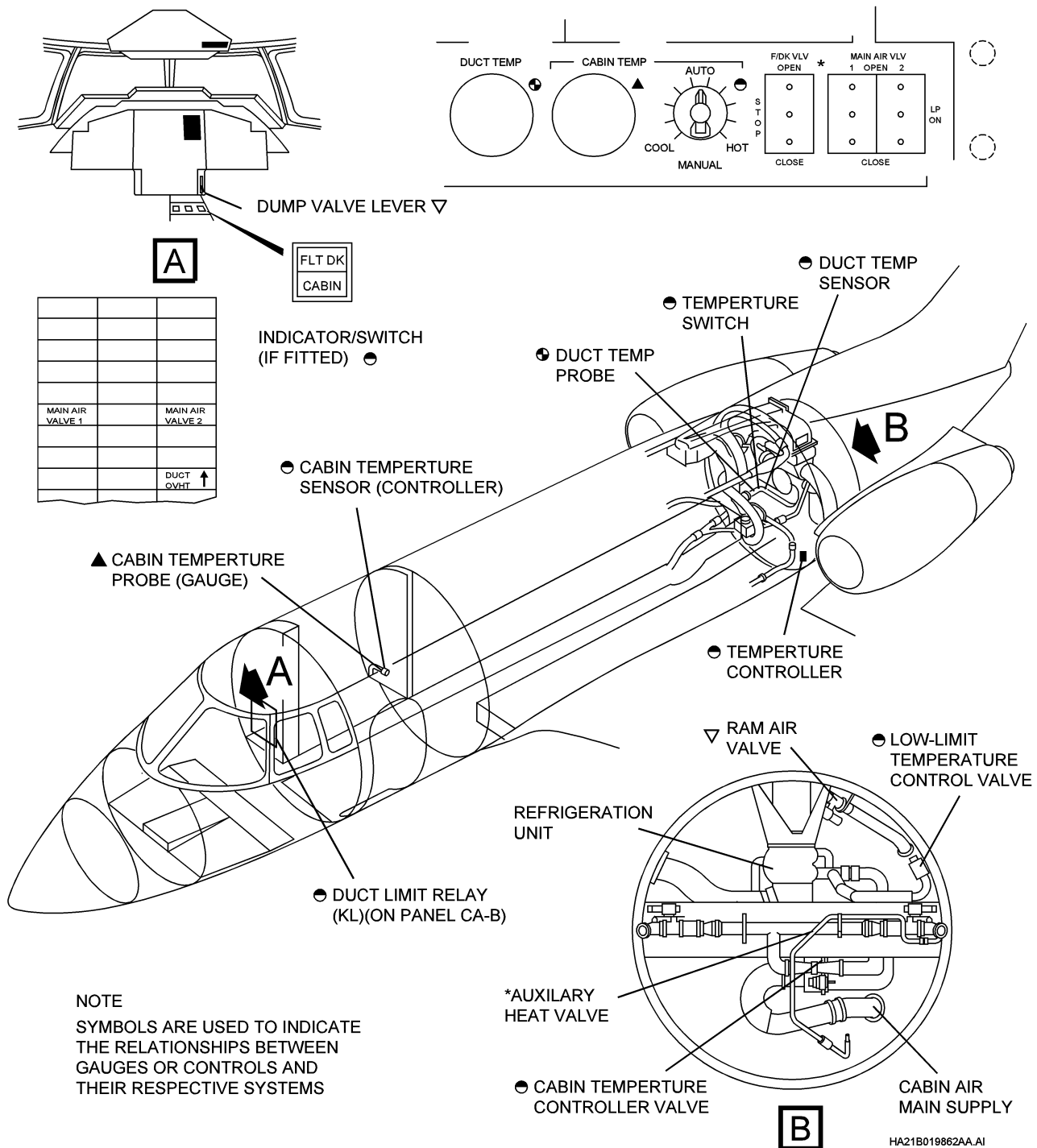
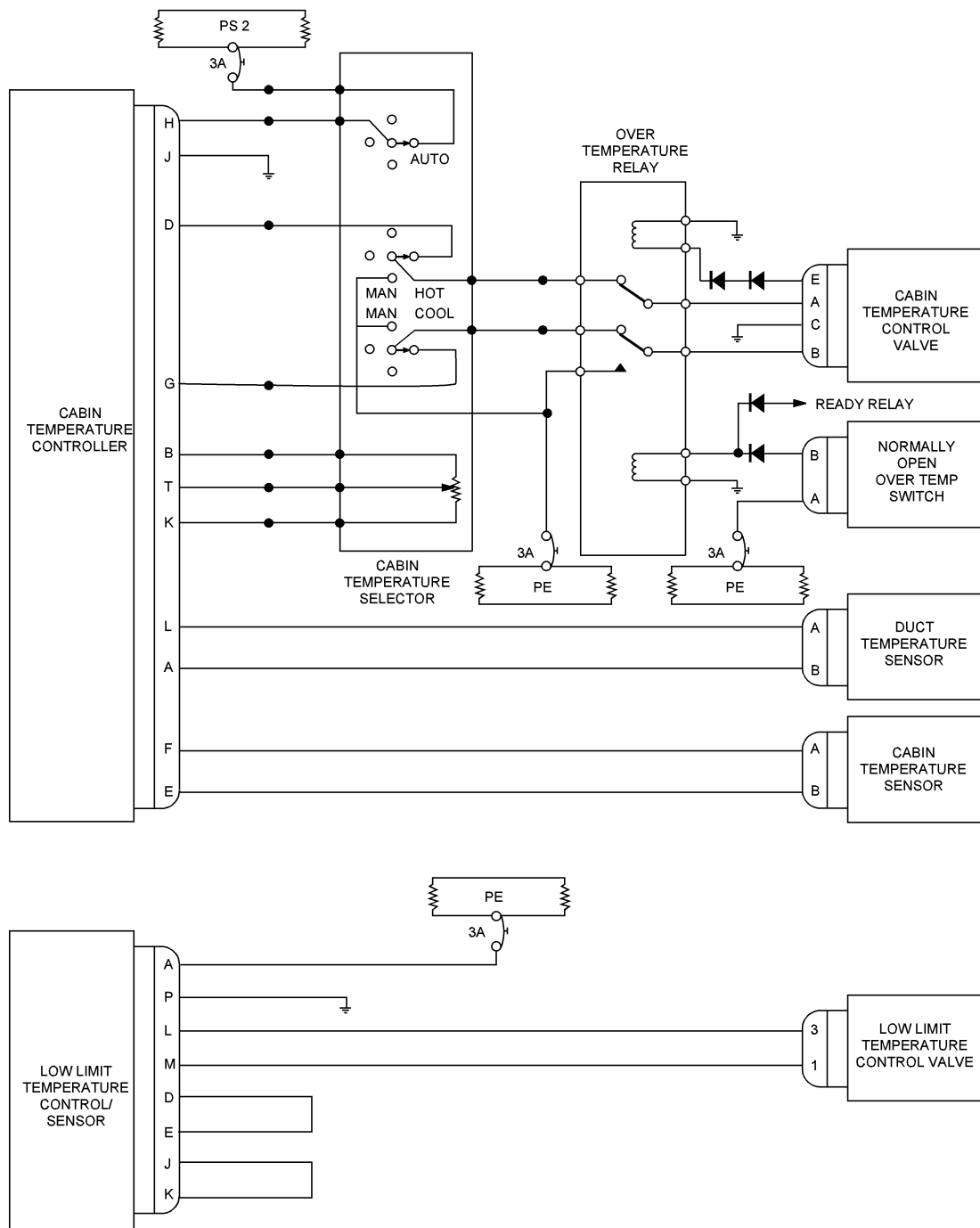


Figure 1
Temperature Control System

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



HA21B025039AA.AI

Figure 2
Cabin Temperature Control

TEMPERATURE CONTROL - ADJUSTMENT/TEST

NOTE: *Temperature selector switch AUTO control positions HOT and COOL are detented. MANUAL control selections are obtained before pointer reaches either detent.*

1. Adjustment/Test

A. Do a functional test of the temperature control system (without air supplies)

- (1) Energize the d.c. busbars (Chapter 24, ELECTRICAL POWER).
- (2) Select CABIN TEMP - AUTO/MANUAL selector switch to MANUAL.
- (3) Select MAIN AIR VLV 1 to LP ON and let the valve reach fully open.
- (4) Make sure the cabin temperature control valve is closed or hold the selector switch to COOL until the valve is closed.
- (5) Hold the selector switch to HOT and make sure the cabin temperature control valve is fully open after 10 to 14 seconds.
- (6) Hold the selector switch to COOL and make sure the cabin temperature control valve is fully closed after 10 to 14 seconds.
- (7) Make sure the valve can be stopped in any intermediate position by intermittent operation of the selector switch.
- (8) Select the AUTO/MANUAL switch to AUTO.
- (9) Select the MAIN AIR VLV 1 to CLOSE and let the valve reach fully closed.
- (10) De-energize the busbars (Chapter 24, ELECTRICAL POWER).

B. Do a functional test of the temperature control system (with air supplies)

NOTE: *The test that follows can be done with air supplied from the engines or the APU.*

- (1) Close the main entry door. Make sure the 'C' panel windows and the escape hatch are closed.
- (2) Start the engines (Chapter 71, POWER PLANT) and run at idle, or start the APU (Chapter 49, POWER PLANT - TURBOMACH APU).
- (3) Energize the d.c. busbars (Chapter 24, ELECTRICAL POWER).
- (4) Select the PRESSN OVRD/AUTO switch to AUTO. Make sure the outflow/safety valves are open.
- (5) If an engine air supply is used, select MAIN AIR VLV 1 and MAIN AIR VLV 2 to OPEN.
- (6) If the APU air supply is used, select APU BLEED AIR to ON.
- (7) Select the AUTO/MANUAL switch to AUTO.

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (8) Select the AUTO/MANUAL switch to HOT. Make sure the duct temperature gauge indicates an increase in temperature but not more than 149° F (65° C) maximum.
- (9) Select the AUTO/MANUAL switch to COOL. Make sure the duct temperature gauge indicates a decrease in temperature but not less than 32° F (0° C) minimum.
- (10) Select the AUTO/MANUAL switch to MANUAL

NOTE: *When the selector is in the MANUAL mode, the selector must be held in the required position (HOT or COOL) for at least 15 seconds to make sure cabin temperature control valve moves full travel.*

- (11) Select the AUTO/MANUAL switch to HOT. Make sure the duct temperature gauge indicates an increase in temperature. Stop the test when a duct temperature of 149° F (65° C) is reached.
- (12) Select the AUTO/MANUAL switch to COOL. Make sure the duct temperature gauge indicates a decrease in temperature but not less than 32° F (0° C) minimum.
- (13) If an engine air supply is used, select MAIN AIR VLV 1 and MAIN AIR VLV 2 to CLOSE.
- (14) If an APU air supply is used, select the APU BLEED AIR to OFF.
- (15) Select the AUTO/MANUAL switch to AUTO.
- (16) De-energize the busbars (Chapter 24, ELECTRICAL POWER).
- (17) Stop the engines (Chapter 71, POWER PLANT) or stop the APU (Chapter 49, POWER PLANT - TURBOMACH APU).

C. Do a functional test of the overheat system

- (1) Energize the d.c. busbars (Chapter 24, ELECTRICAL POWER).
- (2) Select MAIN AIR VLV 1 to LP ON and let the valve reach fully open.
- (3) Select the AUTO/MANUAL switch to MANUAL.
- (4) Select and hold the AUTO/MANUAL switch in the HOT position until the cabin temperature control valve is open.
- (5) De-energize the busbars (Chapter 24, ELECTRICAL POWER).
- (6) Disconnect the connector from the duct over-temperature switch 'US' in the rear equipment bay. Use a shorting plug and link the free connector pins A and B.
- (7) Energize the d.c. busbars (Chapter 24, ELECTRICAL POWER). Make sure the cabin temperature control valve closes and the DUCT OVHT annunciator on the MWS panel comes 'ON'.
- (8) De-energize the d.c. busbars (Chapter 24, ELECTRICAL POWER).
- (9) Remove the shorting plug from the free connector and reinstall the connector to the duct over-temperature switch.

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (10) Energize the d.c. busbars (Chapter 24, ELECTRICAL POWER). Make sure DUCT OVHT annunciator on the MWS panel is 'OFF'.
- (11) Select and hold the AUTO/MANUAL switch in the HOT position and make sure the cabin temperature control valve opens.
- (12) Select and hold the AUTO/MANUAL switch in the COOL position, and make sure the cabin temperature control valve closes.
- (13) Select MAIN AIR VLV 1 to CLOSE and let the valve reach fully closed.
- (14) De-energize the busbars (Chapter 24, ELECTRICAL POWER).

D. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

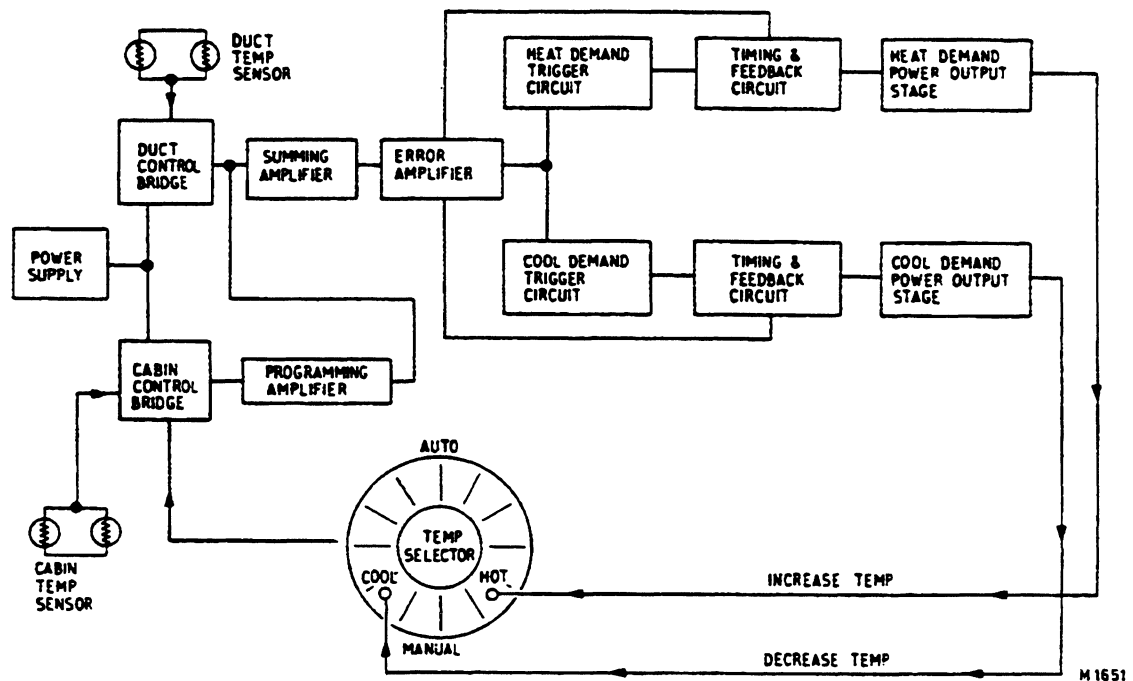
TEMPERATURE CONTROLLER - DESCRIPTION AND OPERATION

1. Description

The temperature controller consists essentially of the reference elements of a cabin control bridge and a duct control bridge, integrated amplifier stages, transistorized trigger, timing, and feedback circuits, transistorized power output circuits, the zener-controlled power supply regulator circuits. All components, with the exception of power resistors, output transistors, power supply inductor, and a chassis-mounted capacitor, are mounted on three printed circuit board assemblies.

The printed circuit board assemblies are protected by a coating of epoxy resin, and the complete temperature control is enclosed by a base cover and a top cover. An electrical connector is incorporated to facilitate connection to the aircraft.

The temperature controller is used to regulate the operation of a temperature control system by interpreting the system requirements and supplying the appropriate power outputs to control the operation of the refrigeration unit and turbine by-pass valves, so that the temperature of the air being supplied to the controlled area is varied as necessary to maintain the air temperature in that area at the selected level.



Temperature controller schematic diagram

Figure 1

EFFECTIVITY:

800XP

21-60-16

Page 1

July 95

2. Operation

A control sensor, located in the forward vestibule, forms one arm and a temperature selector forms a second arm of the cabin control bridge. When the air temperature is at a value corresponding to the setting of the temperature selector, the cabin control bridge is in balance and there is no output from the temperature controller. Any discrepancy between the actual and selected temperatures in the area causes the cabin control bridge to go out of balance and produce an error signal which is amplified by the programming amplifier.

A second control sensor, located in the air inlet duct, forms one arm of the duct control bridge. This provides protection from excessively high or low duct temperatures by overriding the cabin control bridge signal if necessary.

With sufficient difference between the selected and cabin air temperatures the output will be continuous to allow rapid re-positioning of the valves. As the difference decreases the timing and feedback circuit cause the output to be pulsed, so reducing the rate of valve movement. The ratio of on-time to off-time of the output pulses decreases proportionally with the temperature difference until the valves reach their final position.

For example, when the area air temperature is less than the desired temperature, as determined by the setting of the temperature selector, the cabin control bridge is out of balance in such a way as to cause the temperature controller to produce a heat-demand output. This output is applied to the by-pass valves, repositioning the valves to increase the temperature of the air being supplied to the area. This rise in temperature will cause the control sensor to again balance the cabin control bridge.

Conversely, when the area air temperature is more than the desired temperature, the cabin control bridge is out of balance in such a way as to cause the temperature control to produce a cool-demand output. This output is applied to the by-pass valves, repositioning the valves to decrease the temperature of the air being supplied to the area. This drop in temperature will cause the control sensor to again balance the cabin control bridge.

3. Data

Operating voltage	28 volt a.c. (nom)
Operating current (with valve actuator load)	2.0 amp (max)
Ambient operating temperature range	-50°C to +50°C (-58°F to +122°F)

External electrical connections

Connector	KPT02E14-18P (Cannon)
Pin A	Duct Sensor
Pin B	Selector
Pin C	No Connection
Pin D	Heat-Demand Output
Pin E	Cabin Sensor
Pin F	Cabin Sensor
Pin G	Cool-Demand Output
Pin H	+28 volt d.c.
Pin J	Ground
Pin K	Selector
Pin L	Duct Sensor
Pins M,N,P,R,S	No Connection
Pin T	Selector (Wiper)
Pin U	No Connection

EFFECTIVITY:

21-60-16

TEMPERATURE CONTROLLER - TROUBLE SHOOTING

Trouble	Probable cause	Remedy
Unit fails to maintain desired temperature or operates erratically	External components defective	Repair or replace defective component
	Electrical connection defective	Repair connection
	Temperature control defective	Replace control
Unit fails to operate	Loss of input voltage	Repair voltage source
	Electrical connection defective	Repair connection
	Temperature control defective	Replace control

TEMPERATURE CONTROLLER - ADJUSTMENT/TEST

1. Bench check temperature controller *(Figure 501)*

Equipment/Materials	Part/Item No.
Decade Resistor (2 off)	Type 1432J or equivalent
Precision Potentiometer	Type A with turns counting dial
Multimeter	Avometer Model 8 or equivalent
Oscilloscope	Type 561A
Precision Resistors (2 off)	Type NH25
Connector	MS3106E 14-185 or equivalent
Filament lamp (2 off)	No. 327

A. Preparation for test

- (1) Connect temperature controller and test equipment.
- (2) Set selector precision potentiometer to 5.0 turns.
- (3) Set cabin sensor decade resistor to 4002 ohms.
- (4) Switch on 28 volt d.c. power supply (2.0 amperes minimum).

B. DC Input Current Check

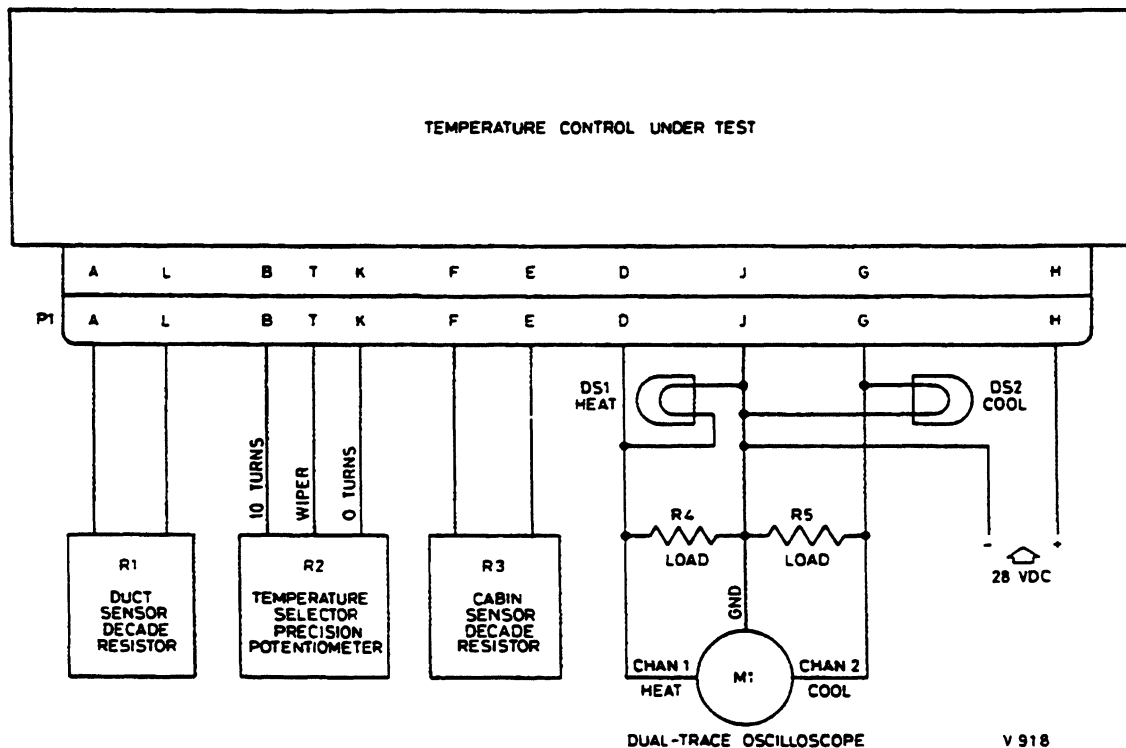
- (1) Adjust duct sensor decade resistor until both lamps are off and there is no evidence of pulsing on either trace on dual-beam oscilloscope (approximately 1500 ohms).
- (2) Temporarily connect a multimeter set to indicate d.c. current in series with the positive lead of the power supply. Input current shall be between 200 and 400 milliamps. Disconnect multimeter and restore input connection.

C. Low Temperature Deadband Check

- (1) Set temperature selector precision potentiometer to 5.0 turns.
- (2) Set cabin sensor decade resistor to 3519 ohms.
- (3) Set duct sensor decade resistor to 4700 ohms.
- (4) Gradually decrease setting of duct sensor decade resistor until cool lamp DS2 just starts flashing with a regular pulsing output.
- (5) Examine typical cool-demand pulse on channel 2 of oscilloscope and ascertain the following:
 - (a) Pulse rise-time is between 1 and 9 milliseconds.

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

- (b) Pulse on-time (i.e., between start of rise-time and end of fall- time) is between 40 and 75 milliseconds.
- (c) Pulse amplitude is in excess of 20 volt d.c.
- (6) Record actual setting of duct sensor decade resistor.
- (7) Gradually increase setting of duct sensor decade until heat lamp DS1 just starts flashing with a regular pulsing output.
- (8) Examine typical heat-demand pulse on channel 1 of oscilloscope and ascertain the following:
 - (a) Pulse rise-time is between 1 and 9 milliseconds.
 - (b) Pulse on-time (i.e., between start of rise-time and end of fall- time) is between 40 and 75 milliseconds.
 - (c) Pulse amplitude is in excess of 20 volt d.c.
- (9) Record actual setting of duct sensor decade resistor.
- (10) Plot recorded decade settings (paragraphs (6) and (9)) on graph of *Figure 502*. The point of intersection must be within the shaded area.



Test connections
Figure 501

D. High Limit Deadband Check

- (1) Set temperature selector precision potentiometer to 5.0 turns.
- (2) Set cabin sensor decade resistor to 4559 ohms.
- (3) Set duct sensor decade resistor to 449.8 ohms.
- (4) Gradually decrease setting of duct sensor decade resistor until cool lamp DS2 just starts flashing with a regular pulsing output. Record setting of duct sensor decade resistor.
- (5) Gradually increase setting of duct sensor decade resistor until heat lamp DS1 just starts flashing with a regular pulsing output. Record setting of duct sensor decade resistor.
- (6) Plot recorded decade settings (paragraphs (4) and (5)) on graph of *Figure 503*. The point of intersection must be within the shaded area.

E. Selector Range Check

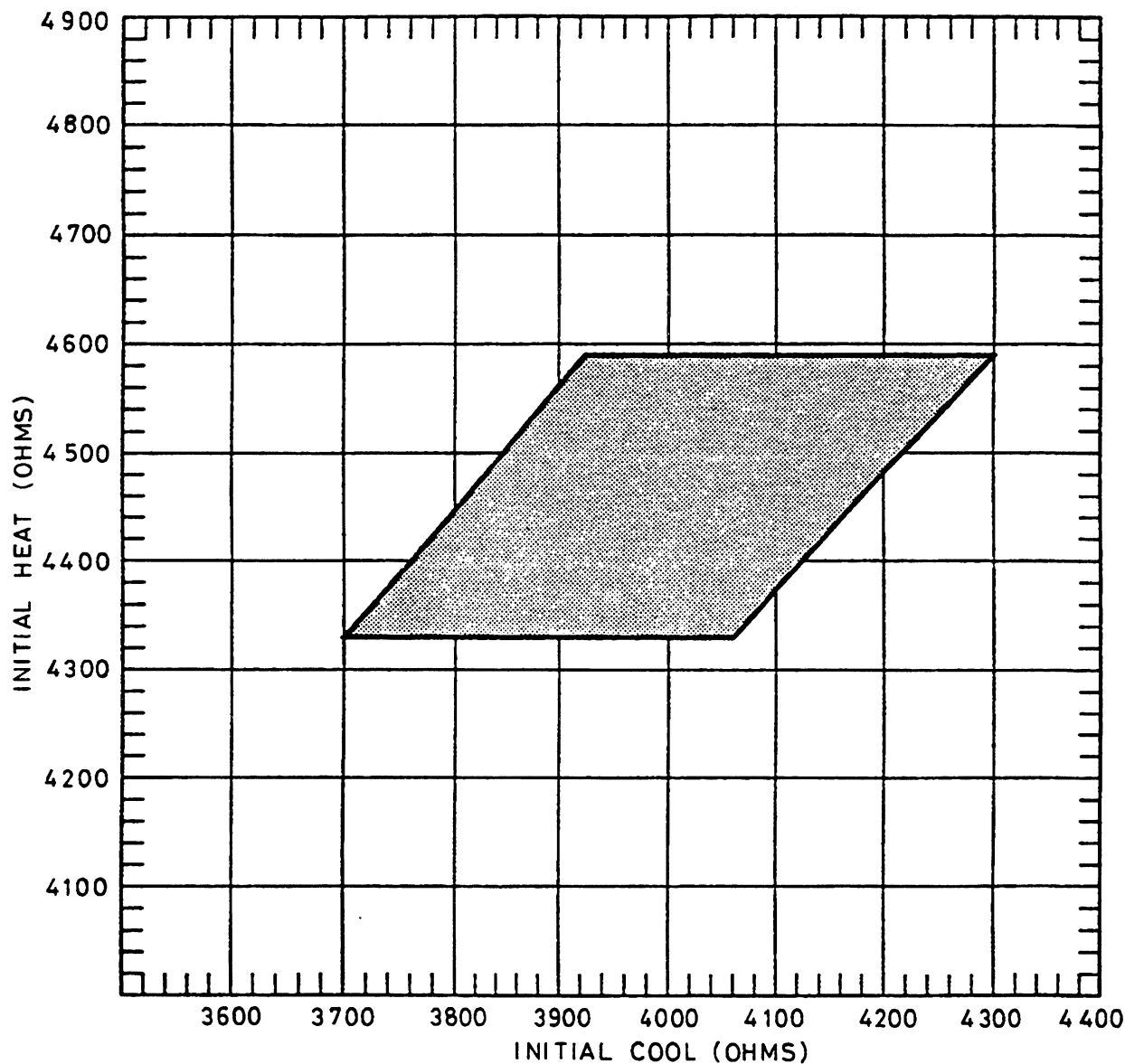
NOTE: *Wait at least 30 seconds after an input change before taking readings during these checks in order to allow circuits to stabilize.*

- (1) Set temperature selector precision potentiometer to 5.0 turns.
- (2) Set cabin sensor decade resistor to 4002 ohms.
- (3) Set duct sensor decade resistor to 1500 ohms.
- (4) Gradually decrease setting of duct sensor decade resistor until heat lamp DS1 just starts flashing with a regular pulsing output.
- (5) Set temperature selector precision potentiometer to 10.0 turns.
- (6) Gradually increase setting of cabin sensor decade resistor until heat lamp DS1 again just starts flashing with a regular pulsing output. Setting of cabin sensor decade resistor shall be between 5833 and 4661 ohms.
- (7) Set temperature selector precision potentiometer to 0.0 turns.
- (8) Gradually decrease setting of cabin sensor decade resistor until heat lamp DS1 again just starts flashing with a regular pulsing output. Setting of cabin sensor decade resistor shall be between 3446 and 2636 ohms.

F. High Temperature Select Check

- (1) Set temperature selector precision potentiometer to 0.0 turns.
- (2) Set cabin sensor decade resistor to 4002 ohms.
- (3) Set duct sensor decade resistor to 449.8 ohms.
- (4) Gradually decrease setting of duct sensor decade resistor until cool lamp DS2 just starts flashing with a regular pulsing output. Record setting of duct sensor decade resistor.
- (5) Gradually increase setting of duct sensor decade resistor until heat lamp DS1 just starts flashing with a regular pulsing output. Record setting of duct sensor decade resistor.

EFFECTIVITY:



V905

Initial heating/initial cooling at low limit
Figure 502

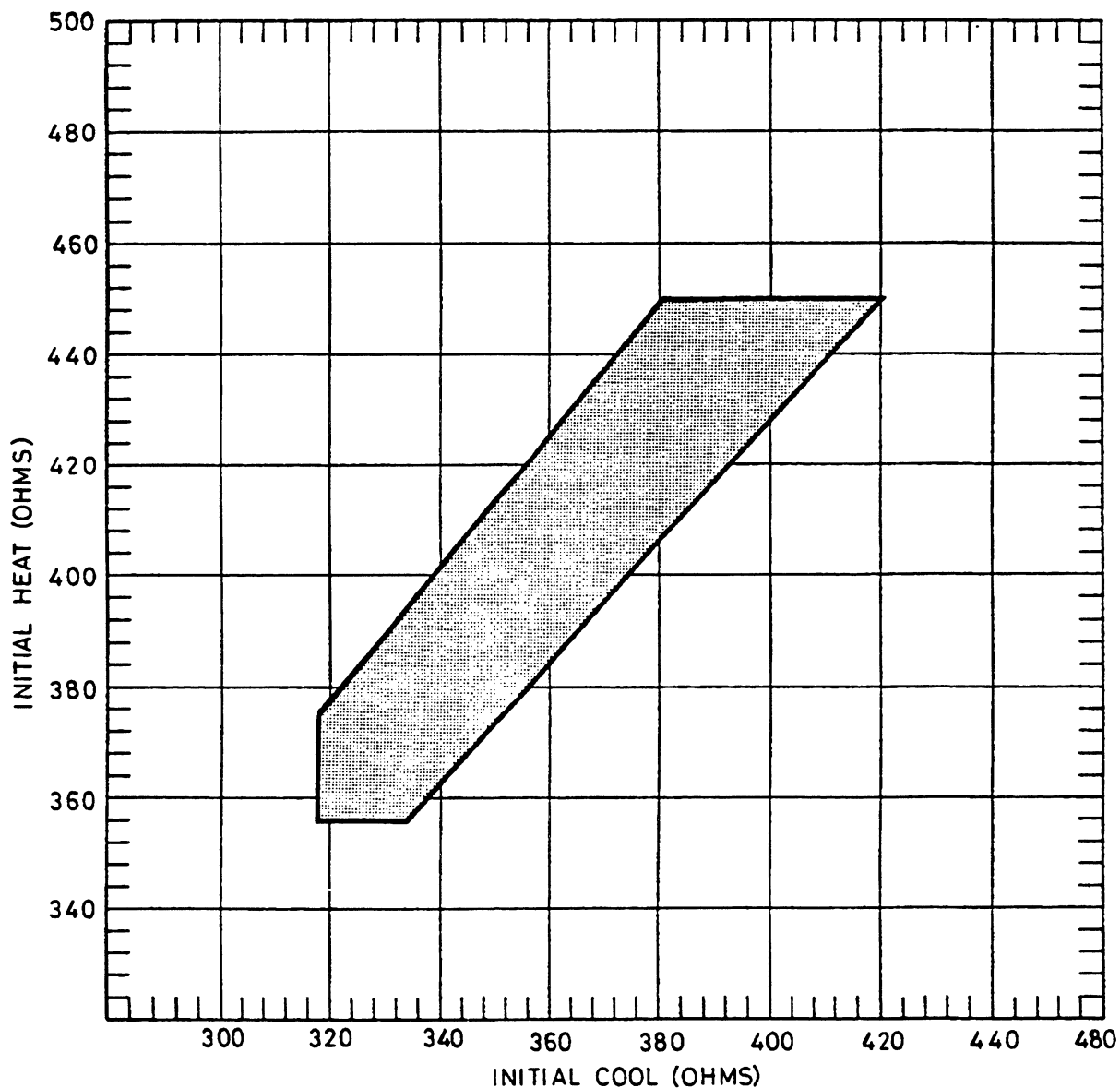
EFFECTIVITY:

800XP

21-60-16

Page 504

July 95



V904

Initial heating/initial cooling at high limit
Figure 503

EFFECTIVITY:

800XP

21-60-16

Page 505

July 95

- (6) Plot recorded decade settings (paragraphs (4) and (5)) on graph of *Figure 503*. The point of intersection must be within the shaded area.
- (7) Set cabin sensor decade resistor to 2500 ohms.
- (8) Gradually increase setting of duct sensor decade resistor until heat lamp DS1 again just starts flashing with a regular pulsing output. Setting of duct sensor decade resistor shall be between 4350 and 4570 ohms.

G. Low Temperature Select Check

- (1) Set temperature selector precision potentiometer to 10.0 turns.
- (2) Set cabin sensor decade resistor to 7000 ohms.
- (3) Set duct sensor decade resistor to 449.8 ohms.
- (4) Gradually decrease setting of duct sensor decade resistor until cool lamp DS2 just starts flashing with a regular pulsing output. Record setting of duct sensor decade resistor.
- (5) Gradually increase setting of duct sensor decade resistor until heat lamp DS1 just starts flashing with a regular pulsing output. Record setting of duct sensor decade resistor.
- (6) Plot recorded decade settings (paragraphs (4) and (5)) on graph of *Figure 503*. The point of intersection must be within the shaded area.
- (7) Set cabin sensor decade resistor to 4600 ohms.
- (8) Gradually increase setting of duct sensor decade resistor until heat lamp DS1 again just starts flashing with a regular pulsing output. Setting of duct sensor decade resistor shall be between 4350 and 4570 ohms.

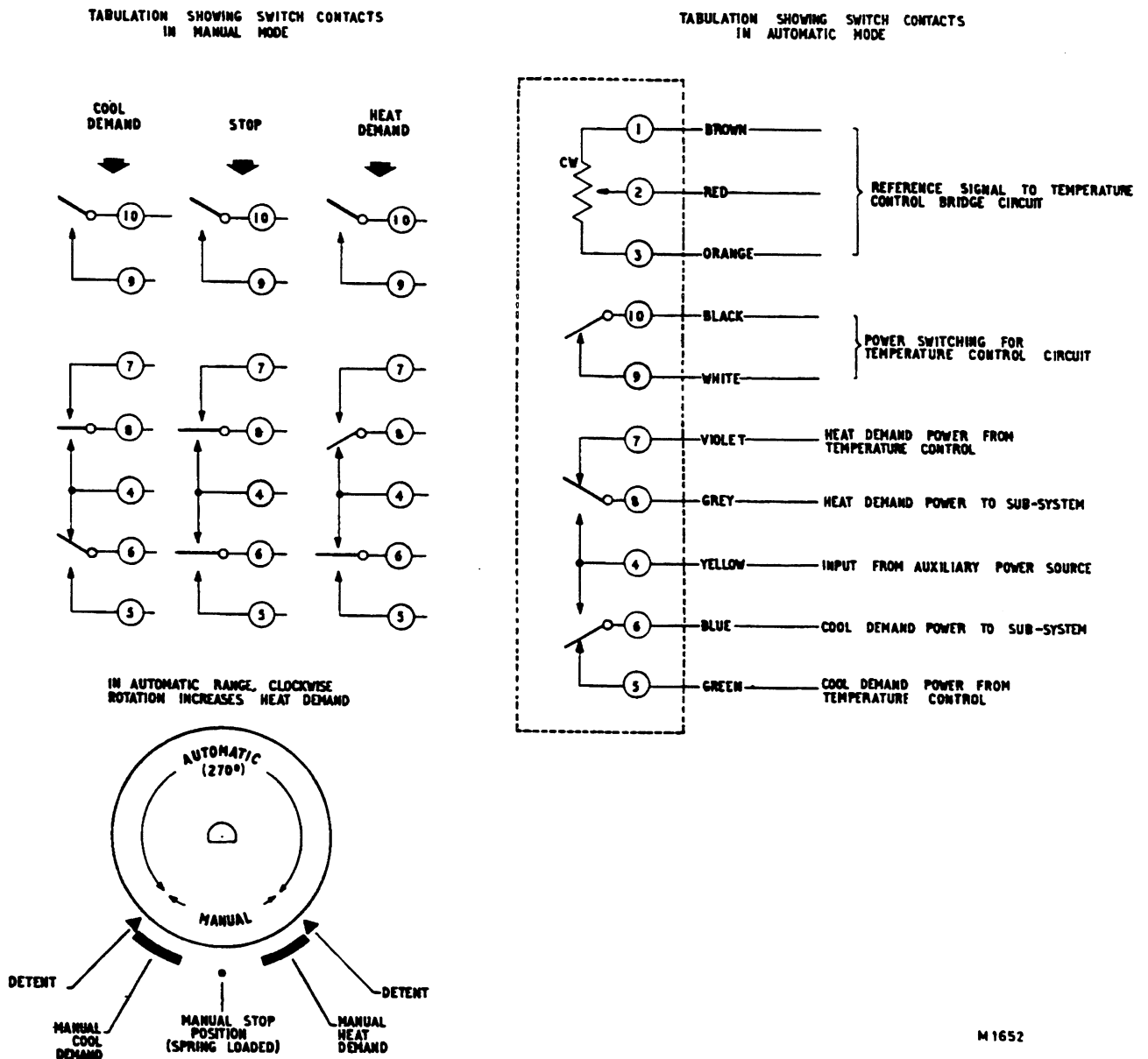
H. Disconnecting from test equipment

- (1) Switch off 28 volt d.c. power supply.
- (2) Disconnect temperature controller from test equipment.

TEMPERATURE CONTROL SELECTOR - DESCRIPTION AND OPERATION

1. Description

The selector has a potentiometer/switch assembly operated by rotation of a shaft. The unit has wire leads for connection to the temperature control system and includes a locating pin and hardware for panel mounting.



M 1652

Temperature selector
Figure 1

EFFECTIVITY:

800XP

21-60-25

Page 1

July 95

2. Operation

The temperature selector provides for selection of automatic or manual modes of air temperature control. Figure 1 shows the areas of automatic and manual operation.

Automatic operation

Automatic mode of (system) operation is achieved throughout the entire 270° 'automatic' arc. The automatic range provides for variation of selected temperature. The extreme clockwise setting representing the maximum heat demand.

The potentiometer forms part of bridge circuit in the temperature control system. When the temperature sensed by an associated temperature sensor is at the value corresponding to the setting of the temperature selector, the bridge circuit is balanced and the temperature control system is equalised. Resetting the temperature selector to a new value causes unbalance in the bridge, producing an error signal which is applied to the temperature controller. The temperature controller regulates the operation of by-pass valves to bring the air temperature at the sensor to that new value. The bridge is then in balance and the temperature control system again becomes equalised.

Throughout the automatic range, switch contacts 9 and 10 remain closed and complete the power supply required by the temperature control circuit. Switch contacts 7, 8, 5 and 6 also remain closed to complete the electrical connections from the temperature control to the by-pass valves.

Manual operation

When the selector is rotated out of the automatic range, the potentiometer ceases to track and switches are operated to disable the automatic mode and engage manual modes of temperature control.

As soon as the selector is rotated out of the automatic range, switch contacts 9 and 10 open and remove power from the temperature control circuit. These contacts remain open throughout the manual range of control.

In the manual COOL demand sector, switch contacts 4 and 6 close and complete an auxiliary circuit to the by-pass valve which responds in the same direction as it would for a COOL demand from the normal (automatic) control. In this setting, switch contacts 7 and 8 are open; switch contact 5 is internally isolated.

In the manual HOT demand sector, switch contacts 4 and 8 close and complete an auxiliary circuit to the controlling by-pass valves which responds in the same direction as it would for a heat demand from the normal (automatic) control. In this setting, switch contacts 5 and 6 are open; switch contact 7 is internally isolated.

In the manual stop position, switch contact 4 is internally isolated and since switch contacts 9 and 10 are open, no power can be applied to the by-pass valves which responds in the same direction as it would for a heat demand from the normal (automatic) control. In this setting, switch contacts 5 and 6 are open; switch contact 7 is internally isolated.

In the manual stop position, switch contact 4 is internally isolated and since switch contacts 9 and 10 are open, no power can be applied to the by-pass valves. The valves therefore remain in the last selected position.

When the selector shaft is released within the limits of the manual range it is spring-loaded to the manual stop position.



HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

3. Data

Potentiometer

Resistance	1000 ohms $\pm$ 5%
Wattage Rating	1.0 watt at 104°F (40°C)
Function Angle	270° + 0° -1°

Switch Contact Rating

Voltage	115 VAC, 400 Hz
Current	1.5 amps at 0.8 PF, Lagging

Wire Lead Connections

Brown	Potentiometer (CW, Hot)
Red	Potentiometer (Wiper)
Orange	Potentiometer (CCW, Cold)
Yellow	Switch contact number 4
Green	Switch contact number 5
Blue	Switch contact number 6
Violet	Switch contact number 7
Grey	Switch contact number 8
White	Switch contact number 9
Black	Switch contact number 10

EFFECTIVITY:

800XP

21-60-25

Page 3

July 95

TEMPERATURE CONTROL SELECTOR - ADJUSTMENT/TEST

WARNING: MAKE SURE THE CIRCUIT BREAKERS ARE OPEN AND TAGGED OR THE ELECTRICAL POWER SUPPLY IS REMOVED FROM THE AIRCRAFT. ENERGIZED CIRCUITS CAN CAUSE INJURY TO PERSONNEL.

Equipment/Materials	Part/Item No.
Megohm bridge 0.5 to 4 x 10 ⁶ megohms ± 5% (Model 1620 or equivalent)	NA30 (Chapter 20-95-00)
Multimeter (Model 260 or equivalent)	NA31 (Chapter 20-95-00)

1. Insulation resistance check

A. Procedure

- (1) With the megohm bridge set at 500 volts d.c. measure the resistance between all the wires connected together and the unit case.
- (2) The resistance must not be less than 10 megohms.

2. Functional test of switch contacts

A. Procedure

- (1) Set the multimeter to OHMS range.
- (2) Refer to *Table 1* and measure the resistance between the wires to check the correct operation of the switch contacts.

3. Functional test of potentiometer

A. Procedure

- (1) Set the multimeter to OHMS for the following test.
- (2) Check the total card resistance between the brown and orange wires is between 945 and 1055 ohms.
- (3) Connect the multimeter between the red and orange wires.
- (4) Set the selector shaft at the counter-clockwise limit within the automatic range. Make sure the resistance is between 0 and 5 ohms.
- (5) Slowly turn the selector shaft clockwise. Make sure the resistance increases smoothly to between 945 and 1055 ohms at the clockwise limit within the automatic range.

Functional test of switch contacts

Table 1

Connect multimeter between wires	Resistance readings selector positions tabulated			
	Manual stop	Manual cool demand	Automatic*	Manual heat demand
White and Black	Infinity	Infinity	Zero	Infinity
Violet and Grey	Any Value	Infinity	Zero	Infinity
Yellow and Grey	Infinity	Infinity	Infinity	Zero
Yellow and Blue	Infinity	Zero	Infinity	Infinity
Green and Blue	Any Value	Infinity	Zero	Infinity
* Check the resistance readings stay constant throughout the automatic range.				

4. Completion

A. Procedure

- (1) Remove all tools, materials and equipment from the work area. Make sure the area is clean.

CABIN TEMPERATURE SENSOR - DESCRIPTION AND OPERATION

1. Description

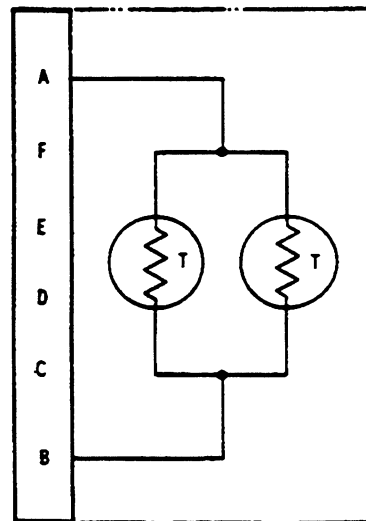
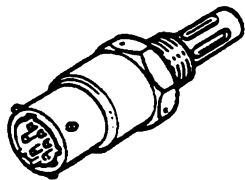
The sensor consists of a sensing element, composed of two thermistor beads wired in parallel, mounted in a probe-type housing. The resistance of the sensing element varies inversely with any change in ambient temperature. The housing is externally-threaded for boss-mounting in an air duct and includes an electrical connector to facilitate connection to the temperature control system.

2. Operation

The sensor forms one arm of a bridge circuit in the temperature control system. When the ambient air temperature at the sensor is at the value selected by the associated temperature selector, the bridge circuit is in balance and the temperature control system is equalised. Any deviation in temperature from the selected value causes the bridge circuit to go out of balance and produce an error signal which is applied to the temperature control. The temperature control regulates the operation of a modulating valve to restore the ambient air temperature at the sensor to the selected value, so that the temperature control system returns to the equalised condition.

3. Data

Operating Ambient Temperature Range	- 65° to 160°F (-54° to 71°C)
Total Resistance at 77°F (25°C)	4002 ± 120 ohms



V301

Temperature sensor
Figure 1

EFFECTIVITY:

800XP

21-60-30

Page 1

July 95

CABIN TEMPERATURE SENSOR - ADJUSTMENT/TEST

CAUTION: DO NOT USE ANY TYPE OF SOLVENT.

1. Bench check temperature sensor (Figure 501 and Figure 502)

Equipment/Materials	Part/Item No.
Megohm Bridge	Model 544B or equivalent
Suitable equipment for stabilizing the temperature of sensor at $77^{\circ} \pm 3^{\circ}\text{F}$ and at $65^{\circ} \pm 3^{\circ}\text{F}$	
Wheatstone Bridge (0 - 10,000 ohms $\pm 0.25\%$)	
Thermometer	Type 15-155 or equivalent

NOTE: *The following instructions provide a means of testing the sensor with standard laboratory equipment. Methods and values used are for overhaul testing and are not intended to reflect calibration accuracy used during manufacture. Two characteristics of the sensor require observance of special precautions in testing; the change in resistance value in response to slight ambient temperature changes, and the dissipation factor (change in sensor temperature with resultant change in resistance value caused by electric current flow). To keep ambient temperature changes to a minimum, it is mandatory that testing be conducted with the aid of an insulated flask, or thermos bottle, filled with water stabilized at temperature specified.*

NOTE: *To keep error caused by the dissipation factor at a minimum, Wheatstone bridge current should not exceed 80 microamperes and excitation voltage should be applied for minimum length of time required to obtain a reading when approaching balance. The final bridge balance should be determined by a momentary application of bridge voltage.*

A. Insulation resistance check

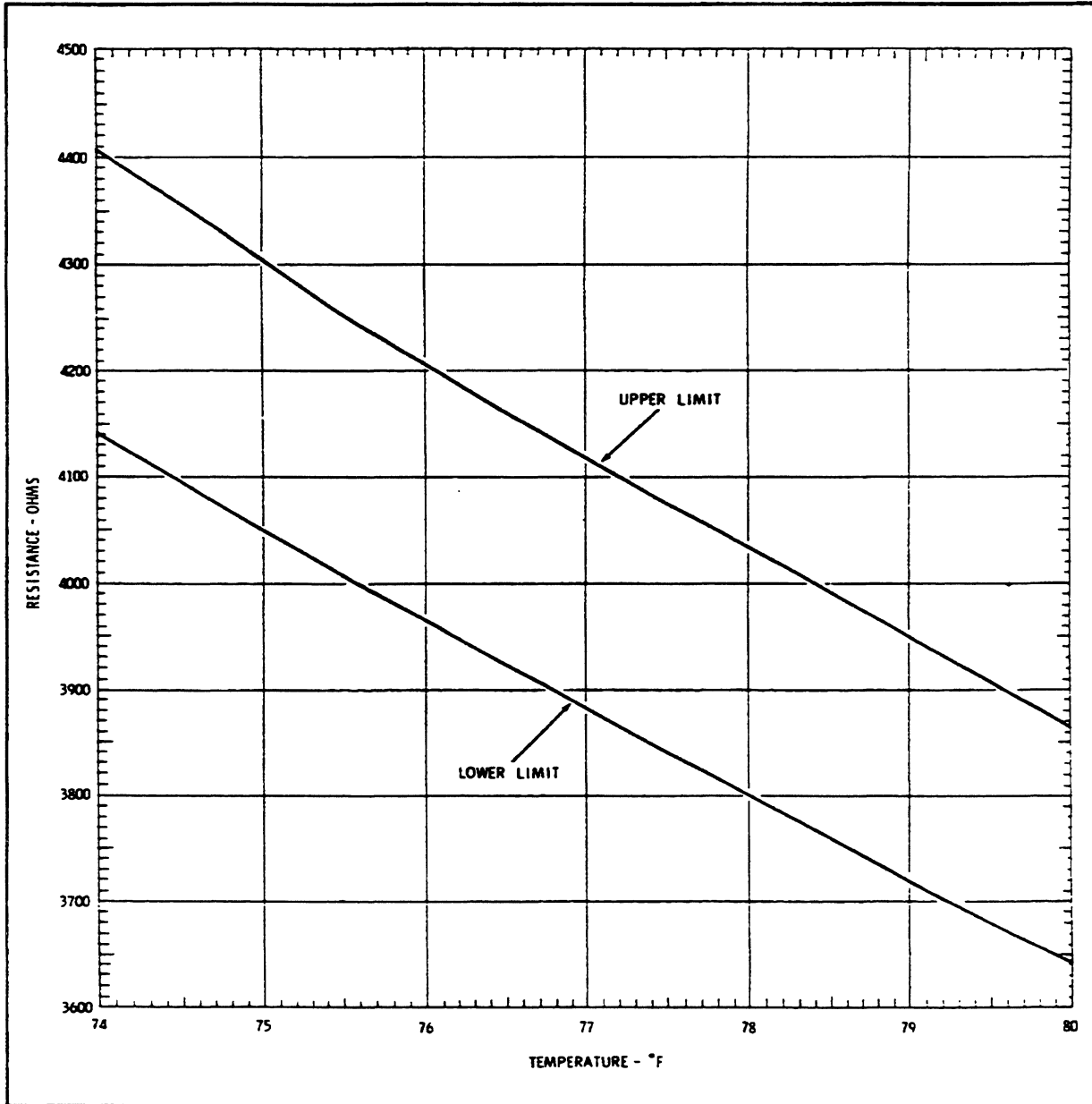
- (1) Using megohm bridge, measure resistance between each connector pin and housing. Resistance shall be greater than 5 megohms.

B. Calibration checks

- (1) Connect Wheatstone bridge between pins A and B of sensor connector. Suspend sensor so that thermistor beads are well-immersed in water stabilized at $77^{\circ} \pm 3^{\circ}\text{F}$ in an insulated flask, being careful to keep electrical connections completely dry.
- (2) Place bulb of thermometer as close as possible to tip of thermistor beads, and allow sensor and thermometer to stabilize at test temperature.
- (3) Null Wheatstone bridge, using momentary applications of excitation voltage. Bridge current should not exceed 80 microamperes.
- (4) Plot resistance value obtained against temperature indicated by thermometer on graph shown in *Figure 501*. Point obtained shall fall between UPPER LIMIT and LOWER LIMIT curves.
- (5) Repeat paragraphs (1) to (3) inclusive with water temperature stabilized at $65^{\circ} \pm 3^{\circ}\text{F}$.

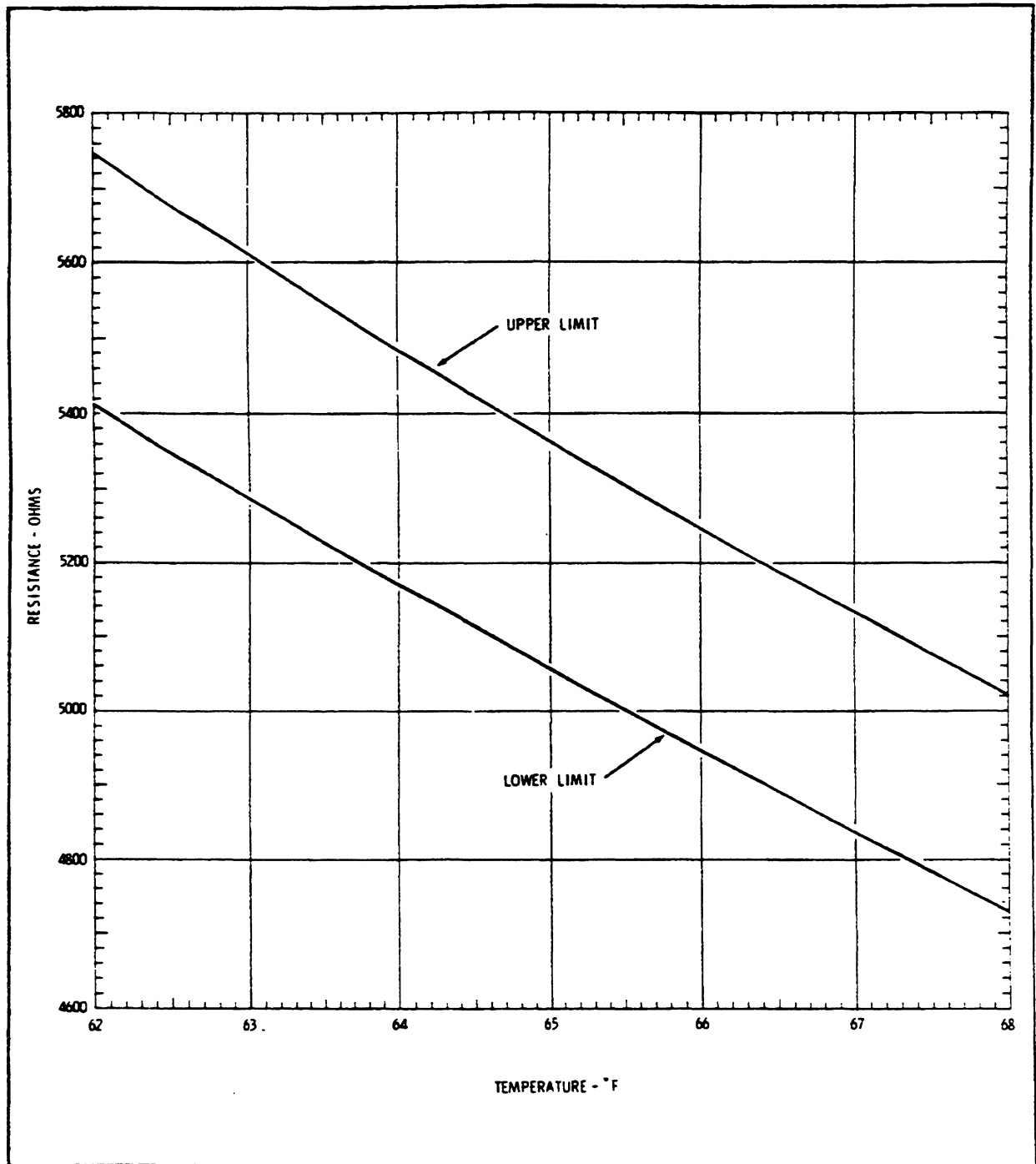
EFFECTIVITY:

- (6) Plot resistance value obtained against temperature indicated by thermometer on graph shown in *Figure 502*. Point obtained shall fall between UPPER LIMIT and LOWER LIMIT curves.



V 302

Resistance/temperature graph, 77°F range
Figure 501



V 303

Resistance/temperature graph, 65°F range
Figure 502

EFFECTIVITY:

800XP

21-60-30

Page 503

July 95

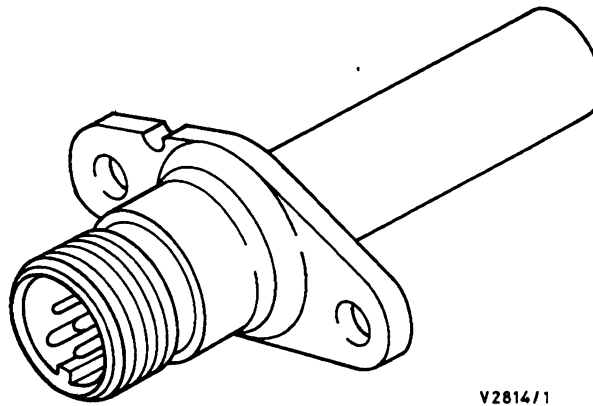
BLEED AIR OVER-TEMPERATURE SWITCH - DESCRIPTION AND OPERATION

1. Description

The bleed air over-temperature switch consists of a stainless steel barrel, a mounting flange and an externally threaded electrical connector. The barrel contains a switch which has two spring bows with attached contacts. A switch is installed downstream of each main air valve in the rear equipment bay.

2. Operation

In normal operation the switch contacts are held open. When the barrel is heated to the set temperature of $554^{\circ} \pm 9^{\circ} \text{ F}$ ($290^{\circ} \pm 5^{\circ} \text{ C}$) it expands, straightens the bows, and the switch contacts close. When the switch detects this over-temperature condition, it switches on the red annunciator HP AIR OVHT 1 or HP AIR OVHT 2 on the MWS panel for the left or right switch. When the bleed air temperature returns to normal, the switch barrel contracts, opens the contacts and the red annunciator goes off.



V2814/1

Bleed air over-temperature switch
Figure 1

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

BLEED AIR OVER-TEMPERATURE SWITCH - MAINTENANCE PRACTICES

1. Removal/Installation

A. Removal

- (1) On panel DA/D, open, safety and tag circuit breaker MAIN AIR VLV 1 or MAIN AIR VLV 2 for the left or right switch circuit.
- (2) Open the rear equipment bay door.
- (3) Disconnect the electrical connector from the switch. Install blanking caps.

NOTE: *Airplanes which are Post mod. 25F699A will have a reinforcing plate installed to the flange of the switch, together with longer bolts, refer to the Illustrated Parts Catalogue (IPC) for part numbers of Pre. and Post Mod. bolts.*

- (4) Remove and retain the two nuts and bolts which secure the switch to the duct. Remove the switch and discard the gasket.
- (5) Blank off the hole in the duct.

B. Installation

- (1) Remove the blank from the duct.
- (2) Install the switch with a new gasket and secure with the nuts and bolts retained at paragraph 1.A.(4).
- (3) Remove the blanks and connect the electrical connector.
- (4) On panel DA/D, close the circuit breaker opened in paragraph 1.A.(1).

2. Checks/Tests

- (1) Do a function test of the temperature control system (TEMPERATURE CONTROL).

WARNING: AIR LEAKS FROM JOINTS IN THE DUCTING WILL BE AT A HIGH TEMPERATURE. BE CAREFUL WHEN EXAMINING FOR LEAKS BY HAND.

- (2) Make sure the disturbed joints have no leaks.
- (3) Make sure the HP AIR OVHT 1 or HP AIR OVHT 2 on the MWS panel do not come on.
- (4) Close the rear equipment bay door.

A. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING TEMPERATURE CONTROL LOW-LIMIT TEMPERATURE CONTROL VALVE DESCRIPTION AND OPERATION

1. INFORMATION

A. Data

Connector	MS3137E7-50P or equivalent
Maximum operational temperature	600° F (316° C)
Ambient temperature range	-65 to 200° F (-54 to 93° C)
Maximum operating pressure	70 psi
Operating current	0 to 105 milliamps

2. DESCRIPTION

The low-limit temperature control valve is an electro-pneumatically activated, right angle poppet-type modulating and shut-off valve which is normally closed (Ref. Figure 1). The valve controls the ECU cold air outlet temperature to a nominal 35° F, to prevent freezing in the water separator, by modulating the flow of compressor inlet air to the mixing muff at the turbine discharge. The valve position is controlled by the torque motor which varies the valve servo pressure from the flow control venturi in response to electrical signals from the low-limit temperature control sensor.

3. OPERATION

The low-limit temperature control sensor senses the ECU discharge temperature downstream of the water separator and modulates the low-limit temperature control valve to maintain a sensed temperature of $36 \pm 2^{\circ} \text{ F}$ ($2.2 \pm 1.1^{\circ} \text{ C}$), Pre-Mod.25G039A, or $41 \pm 2^{\circ} \text{ F}$ ($5 \pm 1.1^{\circ} \text{ C}$), Mod 25G039A.

Supply pressure is ported to the torque motor supply nozzle which is closed by the flapper when the applied electrical signal is zero. As the flapper closes the supply nozzle, chamber 'A' is vented to ambient through the torque motor vent nozzle. As the electrical signal to the torque motor increases, the flapper moves to open the supply nozzle and close the vent nozzle, this raises the pressure in chamber 'A' to open the valve. For a given value of input signal, there is a predetermined valve position.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

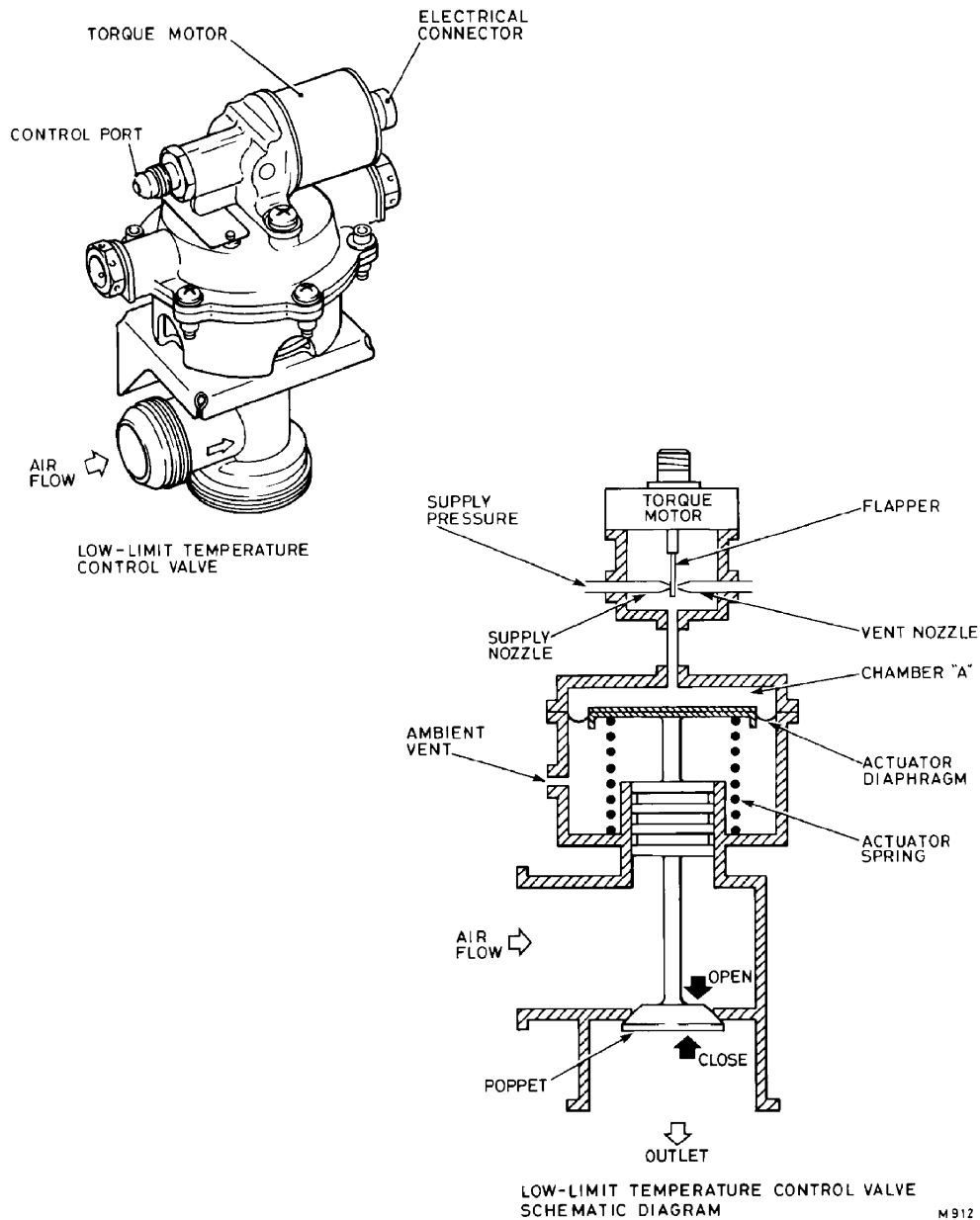


Figure 1
Low-Limit Temperature Control Valve

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING TEMPERATURE CONTROL LOW-LIMIT TEMPERATURE CONTROL VALVE MAINTENANCE PRACTICES

1. REMOVAL/INSTALLATION

A. Removal

	MECH	INSP
(1) On panel DA/D, open, safety and tag the circuit breaker LOW LIMIT TEMP SENSOR.		
(2) Open the rear equipment bay door or remove access panel F170 from above the RH engine pylon (Ref. 800XP Aircraft Flexible Maintenance Schedule, Part 6).		
(3) Disconnect the electrical connector from the valve socket (Ref. Figure 201).		
(4) Disconnect the servo air pressure pipe from the valve control port.		
(5) Disconnect the 1 in. (25.4 mm) inlet pipe from the valve.		
(6) Remove and discard the four split pins which secure the 2 in. (50.8 mm) outlet pipe to the valve, remove and discard the O-ring seal.		
(7) Remove the bolts and special step washers which secure the valve to its mounting bracket and remove the valve.		
(8) Install blanks to the open pipelines and valve connections.		

B. Installation

	MECH	INSP
(1) Remove the blanks from the pipelines and valve connections.		
(2) Install a new O-ring seal to the valve 2 in. (50.8 mm) outlet stem.		
(3) Connect the 2 in. (50.8 mm) outlet pipe to the valve and secure in position with four new split pins.		
(4) Install the valve to its mounting bracket with the special step washers and the bolts.		
(5) Connect the 1 in. (25.4 mm) inlet pipe to the valve.		
(6) Connect the servo air pressure pipe to the valve control port.		
(7) Connect the electrical connector to the valve.		
(8) On panel DA/D, remove the safety tag and close the circuit breaker opened in paragraph 1.A.		
(9) Do a functional test of the temperature control system paragraph 2.A. or paragraph 2.B.		
(10) Make sure the disturbed joints have no leaks.		

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

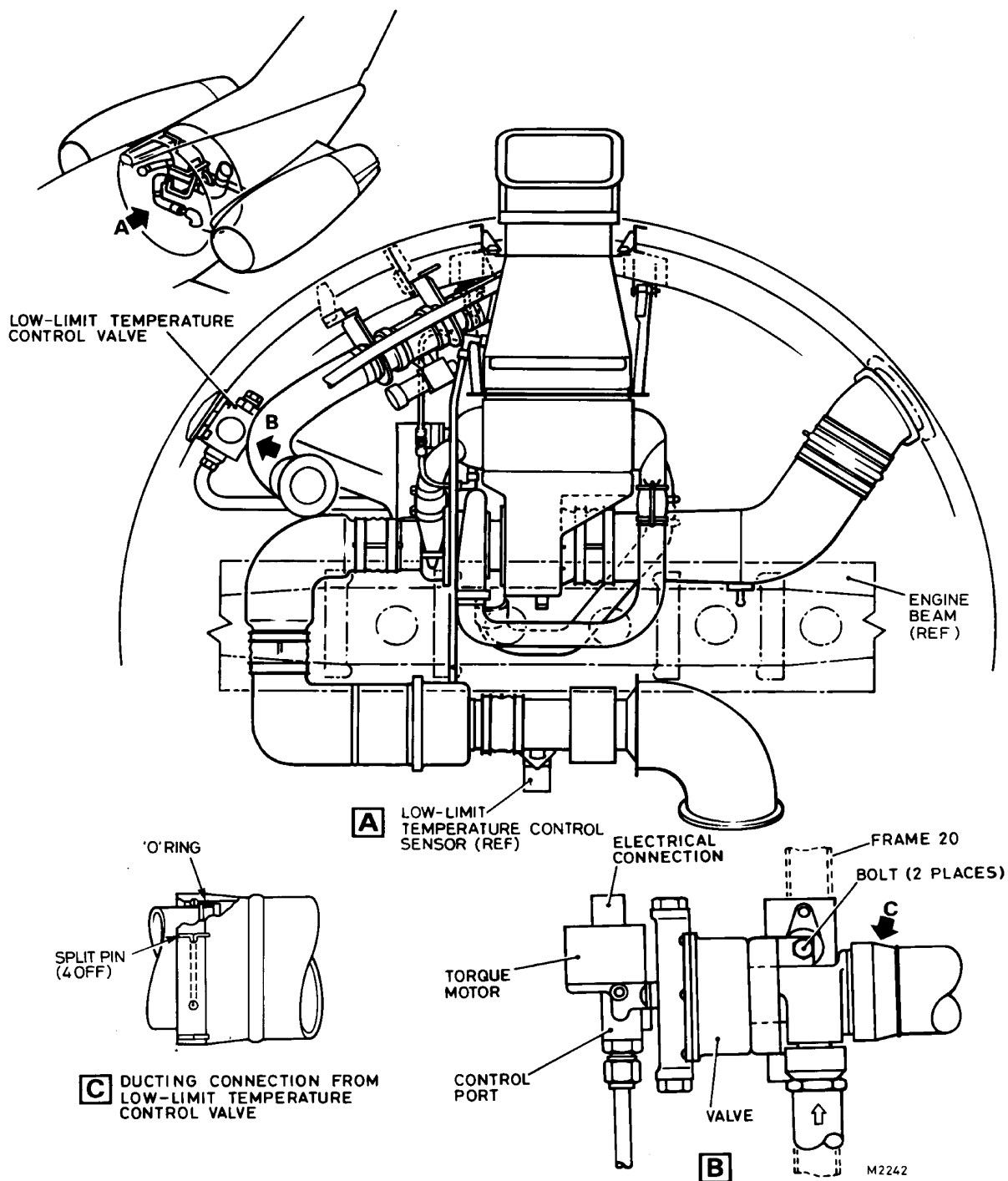


Figure 201
Low Limit Temperature Control Valve - Removal/Installation

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

	MECH	INSP
(11) Close the rear equipment bay door or install the access panel F170 (Ref. 800XP Aircraft Flexible Maintenance Schedule, Part 6).		

C. Close Up

- (1) Make sure that the work area is clean and clear of tools and other equipment.

2. FUNCTIONAL TEST

CAUTION: The following functional test procedures must be accomplished with the ambient temperature/relative humidity level below the curves detailed in Figure 202.

NOTE: Temperature selector switch AUTO control positions HOT and COOL are detented. MANUAL control selections are obtained before pointer reaches either detent.

A. Functionally Test the Temperature Control System (Without Air Supplies)

- (1) Energize the d.c. busbars (Ref. 24-01-00, 201).
- (2) Select CABIN TEMP - AUTO/MANUAL selector switch to MANUAL.
- (3) Select MAIN AIR VLV 1 to LP ON and let the valve reach fully open.
- (4) Make sure the cabin temperature control valve is closed or hold the selector switch to COOL until the valve is closed.
- (5) Hold the selector switch to HOT and make sure the cabin temperature control valve is fully open after 10 to 14 seconds.
- (6) Hold the selector switch to COOL and make sure the cabin temperature control valve is fully closed after 10 to 14 seconds.
- (7) Make sure the valve can be stopped in any intermediate position by intermittent operation of the selector switch.
- (8) Select the AUTO/MANUAL switch to AUTO.
- (9) Select the MAIN AIR VLV 1 to CLOSE and let the valve reach fully close.
- (10) De-energize the busbars (Ref. 24-01-00, 201).

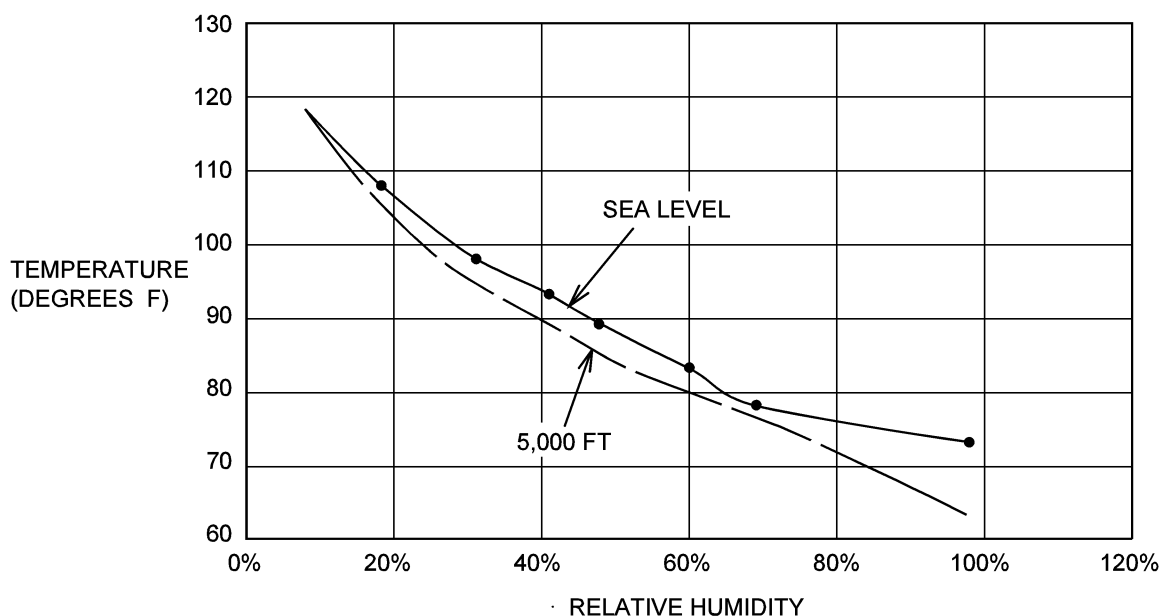
B. Functionally Test the Temperature Control System (With Air Supplies)

NOTE: The following test can be done using air supplied from the engines or the APU.

- (1) Close the main entry door.
- (2) Make sure the 'C' panel windows and the escape hatch are closed.
- (3) Start the engines and run at ground idle (Ref. 71-00-00, 501) or start APU (Ref. 49-11-00, 501 or 49-16-00, 501).

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



M9197
HA00B987997AA

Figure 202
Ambient Temperature/Relative Humidity

- (4) Energize the d.c. busbars (Ref. 24-01-00, 201).
 - (5) Select the PRESSN OVRD/AUTO switch to AUTO.
 - (6) If an engine air supply is used, select MAIN AIR VLV 1 and MAIN AIR VLV 2 to OPEN.
 - (7) If the APU air supply is used, select APU BLEED AIR to ON.
 - (8) Select the AUTO/MANUAL switch to AUTO.
 - (9) Select the AUTO/MANUAL switch to HOT. Make sure the duct temperature gauge indicates a rise in temperature and does not exceed 149° F (65° C) maximum.
 - (10) Select the AUTO/MANUAL switch to COOL, make sure the duct temperature gauge indicates a fall in temperature and not lower than 32° F (0° C) minimum.
- NOTE:** If the duct temperature gauge indicates a temperature below 32° F (0° C), contact Raytheon Technical Support.
- (11) Select the AUTO/MANUAL switch to MANUAL.

NOTE: When the selector is in the MANUAL mode, the selector must be held in the required position (HOT or COOL) for at least 15 seconds to make sure the cabin temperature valve moves full travel.

Raytheon Aircraft Company

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

(12) Select the AUTO/MANUAL switch to HOT and make sure the duct temperature gauge indicates a rise in temperature. Stop the test when a duct temperature of 149° F (65° C) is reached.

(13) Select the AUTO/MANUAL switch to COOL, make sure the duct temperature gauge indicates a fall in temperature and not lower than 32° F (0° C) minimum.

NOTE: If the duct temperature gauge indicates a temperature below 32° F (0° C), contact Raytheon Technical Support.

(14) If an engine air supply is used, select MAIN AIR VLV 1 and MAIN AIR VLV 2 to CLOSE.

(15) If an APU air supply is used, select the APU BLEED AIR to OFF.

(16) Select the AUTO/MANUAL switch to AUTO.

(17) De-energize the busbars (Ref. 24-01-00, 201).

(18) Stop the engines (Ref. 71-00-00, 501) or stop the APU (Ref. 49-11-00, 501 or 49-16-00, 501).

C. Close Up

(1) Make sure that the work area is clean and clear of tools and other equipment.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING TEMPERATURE CONTROL LOW-LIMIT TEMPERATURE CONTROL SENSOR DESCRIPTION AND OPERATION

1. DESCRIPTION

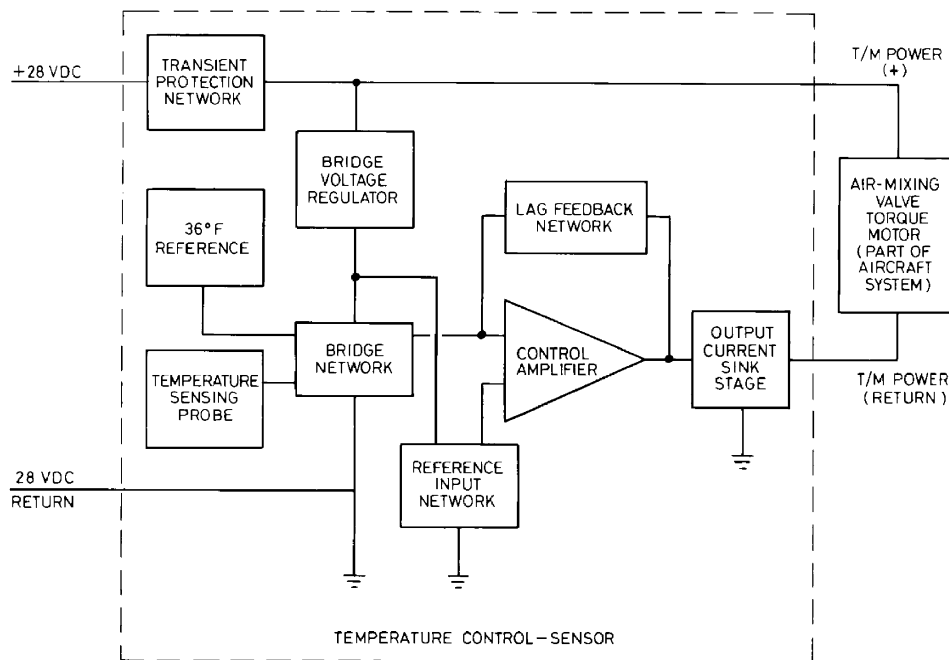
The low-limit temperature control sensor comprises a sensor probe and a single electronic printed circuit board assembly mounted on a chassis with a cover (Ref. Figure 1). The sensor probe and chassis are a single assembly which has an electrical connector.

The thermistor temperature sensing elements are mounted in an aluminum alloy probe with silastic potting compound. Windows in the end of the probe expose the tips of the thermistors to the duct airflow.

The assembly is flange mounted on the air supply duct between the water separator and the hot air mixing muff with the sensor probe immersed in the duct airflow.

2. OPERATION

A single control channel in the assembly supplies the appropriate output signal to the low-limit temperature control valve to control the water separator outlet temperature to $36 \pm 2^\circ \text{F}$ ($2.2 \pm 1.1^\circ \text{C}$), Pre-Mod.25G039A, or $41 \pm 2^\circ \text{F}$ ($5 \pm 1.1^\circ \text{C}$), Mod 25G039A. This output signal is based on information received from the sensor probe in the duct. A schematic diagram of the circuit is shown in Figure 1.



M 915

Figure 1
Low-Limit Temperature Control Valve

LOW-LIMIT TEMPERATURE CONTROL SENSOR - MAINTENANCE PRACTICES

1. Removal/Installation *(Figure 201)*

A. Removal

- (1) On panel DA/D, open, safety and tag the circuit breaker LOW LIMIT TEMP SENSOR.
- (2) Open the rear equipment bay door.
- (3) Disconnect the electrical connector from the control sensor. Install the blanking caps.
- (4) Remove the 3 nuts and bolts which secure the control sensor to the duct. Remove the control sensor.
- (5) Install a blank to the hole in the duct.

B. Installation

- (1) Remove the blank from the duct.
- (2) Install the control sensor and attach with the nuts and bolts.
- (3) Remove the blanking caps and connect the electrical connector.
- (4) On panel DA/D, remove the safety tag and close the circuit breaker opened in paragraph 1.A.(1).
- (5) Do a function test of the temperature control system (TEMPERATURE CONTROL).

**WARNING: AIR LEAKS FROM JOINTS IN THE DUCTING WILL BE AT A HIGH TEMPERATURE.
BE CAREFUL WHEN YOU EXAMINE JOINTS FOR LEAKS BY HAND.**

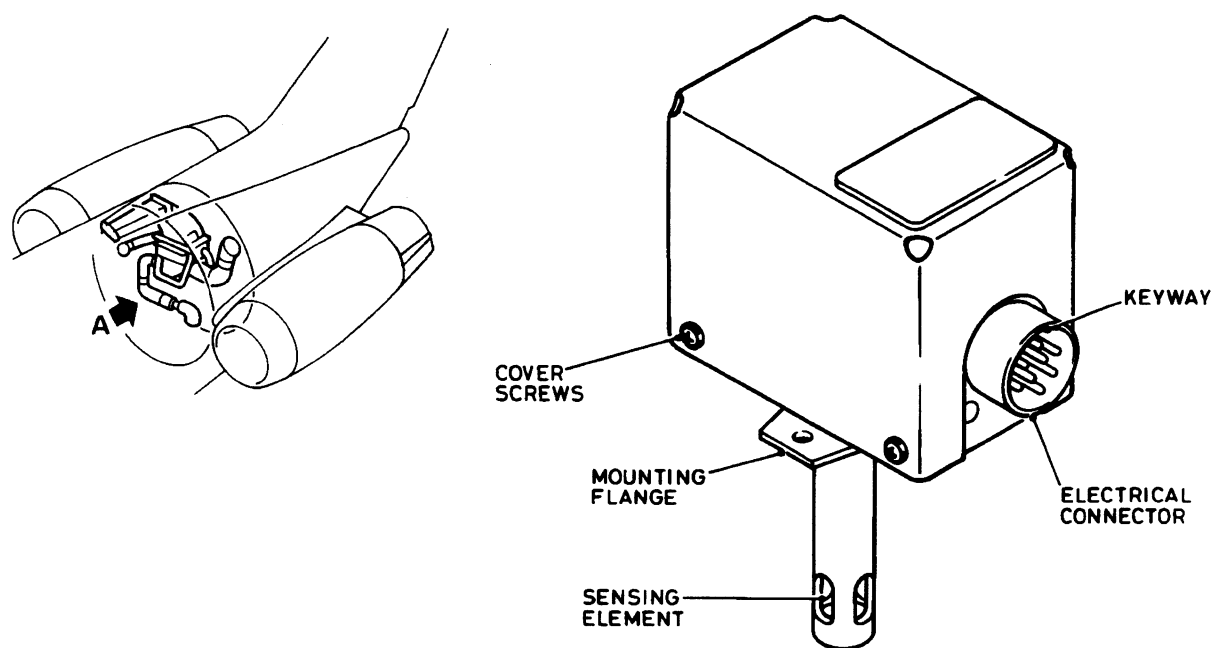
- (6) Make sure the disturbed joints have no leaks.
- (7) Close the rear equipment bay door.

C. Close up

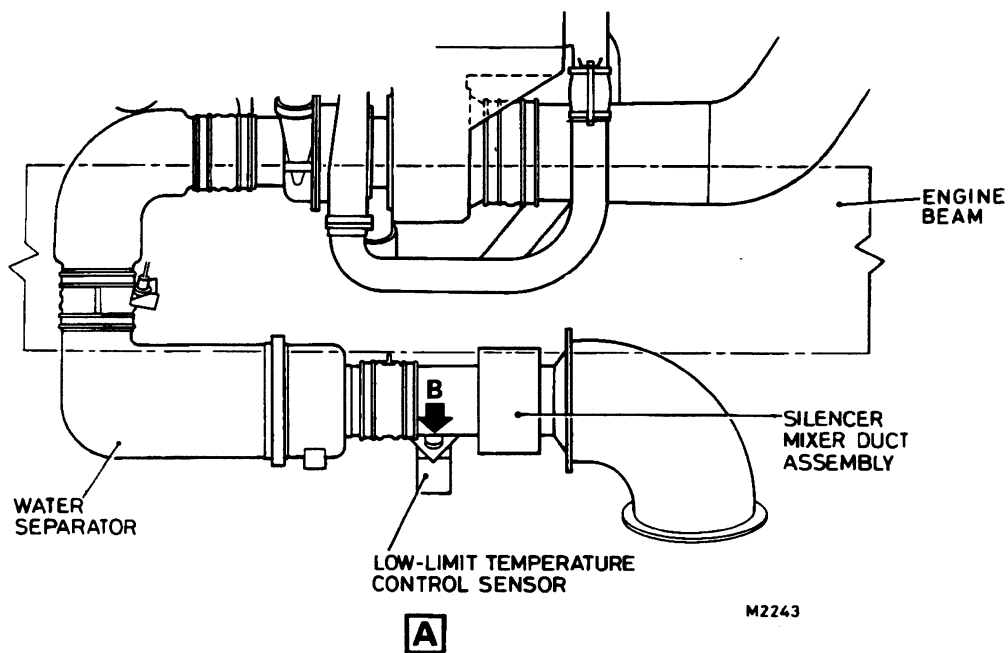
- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL



B LOW-LIMIT TEMPERATURE CONTROL SENSOR



Low-limit temperature control sensor - removal/installation

Figure 201

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AIR CONDITIONING TEMPERATURE CONTROL LOW-LIMIT TEMPERATURE CONTROL VALVE FILTER MAINTENANCE PRACTICES

1. INFORMATION

Equipment/Materials	Part/Item No.
Detergent, liquid (water soluble)	205 (Ref. AMM 125/H-20, 20-95-201)
Ultrasonic cleaner	Local supply

2. PROCEDURE

A. Removal

	MECH	INSP
(1) Put a warning notice in position, in the flight compartment, to prevent the operation of the air conditioning system.		
(2) Remove the right lower APU bay access panel F169 (Ref. AFMS-800XP - Panel Location Charts).		
(3) Locate the air control pipe to the low-limit temperature control valve.		
(4) Disconnect the union nut from the filter body.		
(5) Remove the filter from the low-limit temperature control valve pipe union.		
NOTE Record the direction of the flow arrow to assist with installation.		

B. Cleaning

- (1) Clean the filter with an ultrasonic cleaner and mild detergent solution (Item 205) for 15 minutes.
- (2) Thoroughly rinse the filter with clean water, flush the inside of the filter against the direction of flow arrow.
- (3) Use dry and filtered shop air regulated to 40 psi, against the flow arrow to dislodge any particles from the filter media and to thoroughly dry the filter.
- (4) Make sure that the filter is not damaged. If the filter is damaged it must be replaced.

Hawker Beechcraft Corporation

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

C. Installation

	MECH	INSP
(1) Install the filter into the low-limit temperature control valve pipe union. Make sure the flow arrow points in the correct direction.		
(2) Connect the pipe to the filter and tighten the union nut.		
(3) Remove the warning notice from the flight compartment.		
(4) Do a functional test (with air supplies) of the temperature control system (Ref. 21-60-00, 501 paragraph 1.B.). NOTE During the functional test make sure that there are no air leaks from the filter.		
(5) Install the right lower APU bay access panel F169 (Ref. AFMS-800XP - Panel Location Charts).		

D. Close Up

- (1) Make sure that the work area is clean and clear of tools and other equipment.

CABIN TEMPERATURE CONTROL VALVE - DESCRIPTION AND OPERATION

1. Description (Figure 1)

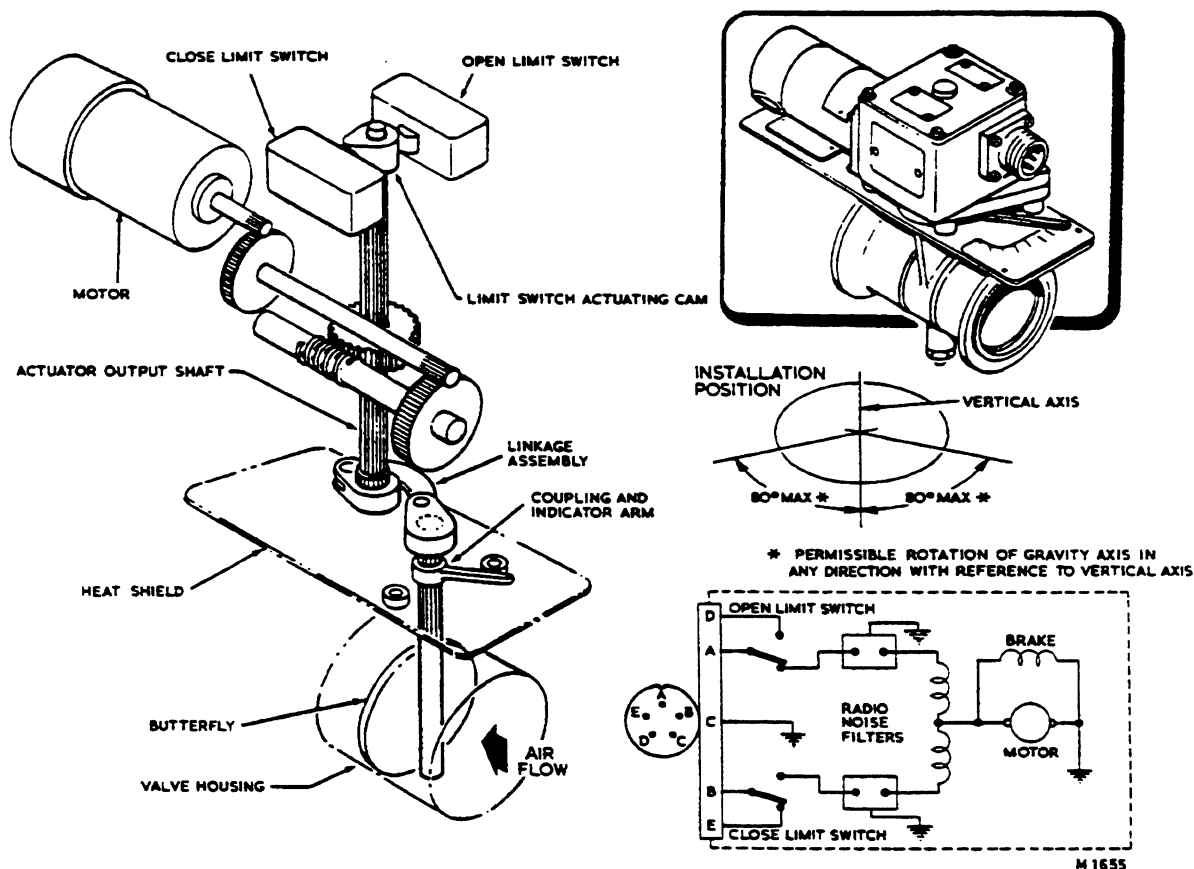
The cabin temperature control valve consists of an electro-mechanical rotary actuator and a valve housing assembly.

The actuator consists of a radio noise-free motor, friction brake, limit switches, gear system, linkage, and output shaft. The gear shaft supports a cam which actuates the limit switches. A pointer attached to the output shaft indicates, in conjunction with a plate mounted on the heat shield, the position of the butterfly. A jumper wire is provided for grounding the actuator.

The heat shield, mounted between the actuator and the valve housing assembly, protects the actuator from heat radiated by the valve housing assembly.

The valve housing assembly is a housing which serves as an air-flow duct, and a butterfly assembly. Direction of normal air flow is indicated by an arrow on the valve housing. However, air may flow in either direction; a slightly higher port leakage rate will result when air flows against the direction indicated.

The top of the butterfly shaft engages the serrated linkage assembly. The butterfly rotates on a ball bearing and is positioned vertically within the duct by an adjustment screw. If the valve is installed in a position other than that shown on *Figure 1*, a drain hole must be provided in the actuator.



Cabin temperature control valve
Figure 1

EFFECTIVITY:

800XP

21-60-67

Page 1

July 95

2. Operation

This unit is controlled by an external electrical circuit and the two limit switches. When pins A and C are energized, the butterfly will move to full-open position. Air may flow through the valve in either direction. When pins B and C are energized, the butterfly will move to full-closed position. When the butterfly reaches full-open or full-closed position, the appropriate limit switch is mechanically tripped, opening the circuit and stopping actuator travel.

When the butterfly is full-open, circuit AD is closed by the open limit switch. When the butterfly is full-closed, circuit BE is closed. These circuits can be utilized to operate remote equipment.

Should the motor circuit be de-energized before one of the limit switches is tripped, the magnetic brake, in conjunction with the gear train, will hold the butterfly at the selected position. Circuits AC and BC will remain closed so that the butterfly may subsequently be actuated in either direction

3. Data

Operating Time	10 to 14 seconds
Actuator	
Pin A	Open
Pin B	Closed
Pin C	Earth
Pin D	Energized when valve is fully open
Pin E	Energized when valve is fully closed
Operating Voltage	26 volt d.c.
Operating Current	1.0 ampere
Duty Cycle	Continuous

CABIN TEMPERATURE CONTROL VALVE - TROUBLE SHOOTING

Fault	Probable Cause	Remedy
Valve leaks excessively with butterfly closed	Actuator out of adjustment	Replace valve
	Valve assembly defective	Replace valve
	Butterfly defective	Replace valve
Valve operation sluggish or erratic	Electrical connection loose or defective	Tighten connection or replace defective component
	Butterfly linkage, or gear train binding	Replace valve
Valve inoperative	Electrical connection loose or defective	Tighten connection or replace defective component
	Actuator defective	Replace valve
	Butterfly bound in housing	Replace valve

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

CABIN TEMPERATURE CONTROL VALVE - REMOVAL/INSTALLATION

1. Removal/Installation

A. Removal

- (1) On panel DA/D, open, safety and tag the CABIN TEMP CTL MANUAL and CABIN TEMP CTL AUTO breakers (Chapter 24, ELECTRICAL POWER).
- (2) Disconnect the electrical connector from the valve.
- (3) Remove the cable clip from the valve.
- (4) Release the clamps that attach the valve to the ducting, and remove the valve and seals.
- (5) Install blanks to the valve and ducts.

B. Installation

Equipment/Materials	Part/Item No.
Torque wrench capable of 40-50 lbf.in. (4.52-5.65 Nm)	Local supply

- (1) Remove the blanks from the valve and ducts.
- (2) Put the valve in position with the arrow on the valve body pointed in the opposite direction of airflow.

NOTE: *The airflow through the valve is not significantly restricted when installed in the position. There is not sufficient room to install the valve with normal flow in the direction of airflow.*

- (3) Install serviceable seals and attach the valve to the ducting with the clamps.
- (4) Torque tighten the clamp-bolt nuts to 45 lbf.in. (5.08 Nm).
- (5) Reconnect the electrical connector to the valve.
- (6) Attach the cable clip to the valve.
- (7) Remove the safety tag and close the circuit breakers opened in paragraph 1.A.(1).
- (8) Do a functional test of the temperature control system (TEMPERATURE CONTROL).

WARNING: AIR LEAKS FROM JOINTS IN THE DUCTING WILL BE AT A HIGH TEMPERATURE. BE CAREFUL WHEN YOU EXAMINE JOINTS FOR LEAKS BY HAND.

- (9) Make sure the disturbed joints have no leaks.

C. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

DUCT TEMPERATURE SENSOR - DESCRIPTION AND OPERATION

1. Description

The duct temperature sensor has a sensing element, a plug for holding the element in position, shield, housing, and a connector. Resin in the housing and shield gives thermal insulation for the sensing elements wire leads. The sensor is installed in the duct between the silencer and the pressure bulkhead.

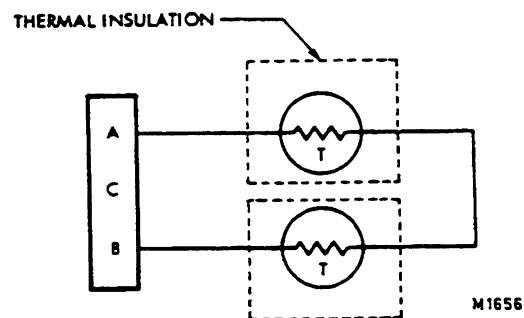
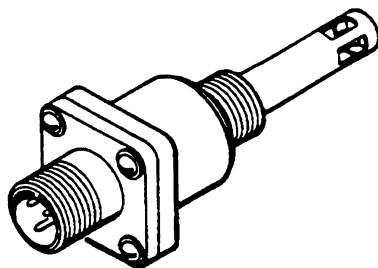
2. Operation

The sensor is one part of the duct control bridge in the cabin temperature controller. The resistance of the sensing element varies inversely with temperature changes surrounding the sensing element. The resistance of the sensing element can be measured at the pins of the connector.

3. Data

Resistance:

39° to 41° F (3.89° to 5° C)	4678 ohms
76° to 78° F (24.44° to 25.56° C)	2001 ohms
119° to 121° F (48.33° to 49.44° C)	841 ohms



Duct temperature sensor
Figure 1

EFFECTIVITY:

800XP

21-60-75

Page 1

July 95

DUCT OVER-TEMPERATURE SWITCH - DESCRIPTION AND OPERATION

1. Description

The duct over-temperature switch consists of a housing which contains normally open electrical contacts and a temperature sensitive element. The switch is installed in the duct between the silencer and the pressure bulkhead.

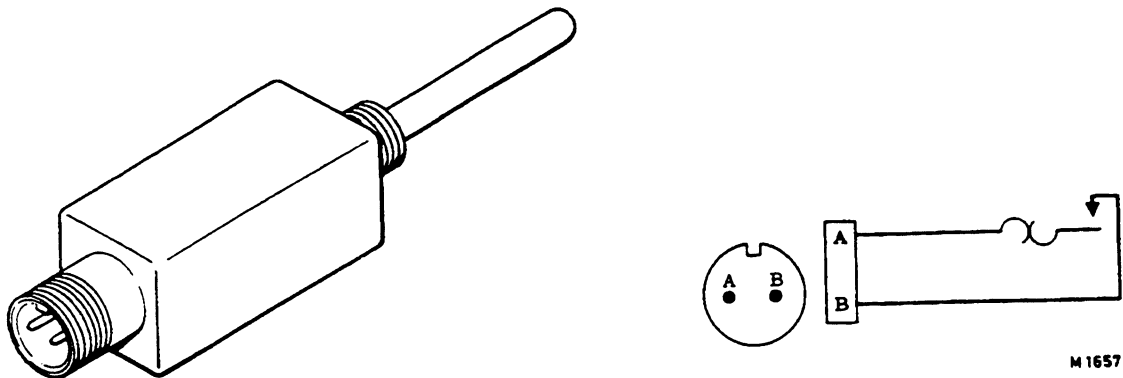
2. Operation

When the duct air temperature increases to approximately 240° F the switch contacts close. On the MWS panel the amber DUCT OVHT will come on and the switch will actuate the duct temperature limit relay. The relay then closes the cabin temperature control valve. When duct temperature decreases, the switch returns to the normally open position, de-activates the relay and the amber DUCT OVHT, and the cabin temperature control valve opens.

3. Data

Actuating temperature:

222° ± 10° F (105.6° ± 5.6° C)



Duct over-temperature switch
Figure 1

EFFECTIVITY:

800XP

21-60-85

Page 1

July 95

DUCT AND CABIN TEMPERATURE DETECTORS - DESCRIPTION AND OPERATION

1. Description

The duct and the cabin temperature detectors consist of a stainless steel barrel and an electrical connector. The barrel contains a resistance thermometer element made of helically wound platinum wire. The duct temperature detector is installed downstream of the silencer in the rear equipment bay. The cabin temperature detector is installed in the cabin.

2. Operation

A. Duct temperature detector

The duct temperature detector detects the duct air temperature (cabin inlet air temperature) before the air enters the pressure cabin. The resistance change in the platinum wire with temperature, is indicated on a temperature gauge DUCT TEMP on roof panel CG.

B. Cabin temperature detector

The cabin temperature detector detects the temperature of the air in the cabin. The resistance change in the platinum wire with temperature, is indicated on a temperature gauge CABIN TEMP on roof panel CG.

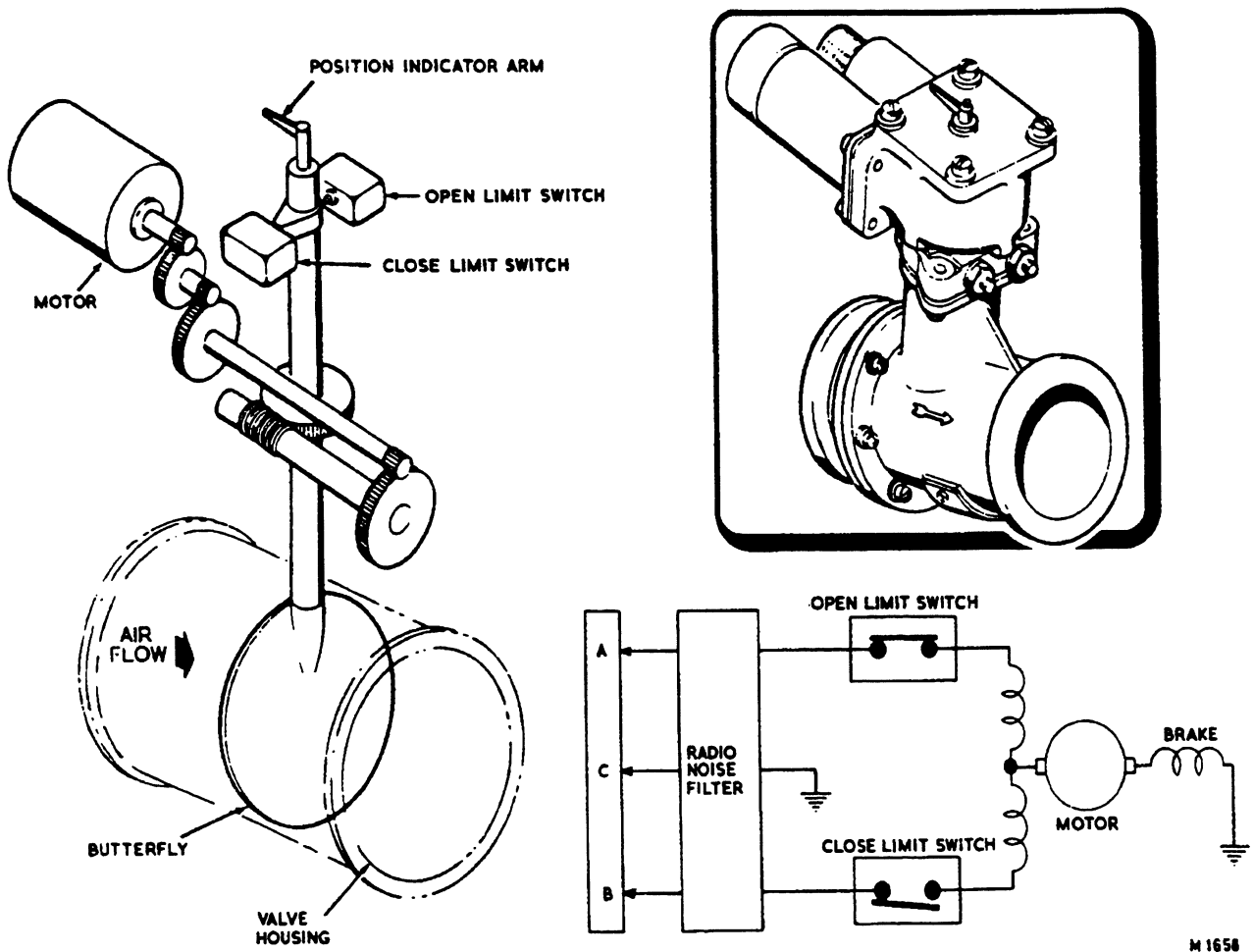
AUXILIARY HEATING VALVE - DESCRIPTION AND OPERATION

1. Description

The electric shut off and modulating valve has an electromechanical rotary actuator and a butterfly valve assembly. The actuator is mounted on the valve assembly.

The actuator contains an electric motor which is equipped with a magnetic friction brake, a gear train, two limit switches, and an output shaft. The splined end of the motor shaft extends into the gear case to motivate the gear train, the output shaft, and the limit switch actuating cam.

The valve has a spoon-valve assembly and an air-flow duct. The spoon is bearing mounted in the duct and is connected to the actuator through a gear train that operates an indicator on top of the actuator housing.



Auxiliary heating valve
Figure 1

EFFECTIVITY:

800XP

21-60-105

Page 1

July 95

2. Operation

This unit is controlled by external circuit and the two limit switches. When the motor is energized, the gear train turns, rotating the spoon to the open or closed position. When the spoon is rotated to either extreme position, the actuating cam opens the appropriate limit switch to interrupt the electric circuit.

In addition to full rotation in either direction, the spoon can be modulated, as desired, to any position between fully open and fully closed. When the motor circuit is de-energized within the cycle of spoon rotation in either direction, and before the limit of spoon travel has been reached, the gear train and the magnetic friction brake, holds the butterfly at the position selected until the motor circuit is re-energized.

3. Data

Operating Air Pressure	255 psig (max.)
Operating Air Temperature	487°C (910°F) (max.)
Ambient Air Temperature Range	-54° to 107°C (-65° to 225°F)
Operating Time	7 to 13 sec.
Duty Cycle	Continuous to 93°C (200°F) ambient, 1/2 min. on, 2 1/2 min. off to 107°C (225°F)
Operating Current	0.2 amp at 26 volt d.c.
Receptacle	
Pin A	Open
Pin B	Close
Pin C	Earth

AUXILIARY HEATING VALVE - TROUBLE SHOOTING

Trouble	Probable Cause	Remedy
Leakage at duct connection	Connection loose or defective	Tighten connection or replace defective component
Unit inoperative	Electric connection loose or defective	Tighten connection or replace defective component
	Actuator defective	Replace unit
	Shut-off valve assembly defective	Replace unit
Unit operates only in one direction	Actuator defective	Replace unit
Unit operates in a sluggish or erratic manner	Electric connection loose or defective	Tighten connection or replace defective component
	Butterfly binding or sticking in housing	Replace unit
	Actuator defective	Replace unit
Excessive port leakage	Close limit switch out of adjustment	Replace unit
	Shut-off valve assembly defective	Replace unit

Raytheon Aircraft

HAWKER 800XP AIRCRAFT MAINTENANCE MANUAL

AUXILIARY HEATING VALVE - MAINTENANCE PRACTICES

1. Auxiliary heating valve

A. Removal

- (1) On panel DA/D, open and safety clip and tag the flight deck heating valve circuit breaker (Chapter 24, ELECTRICAL POWER).
- (2) Disconnect the electrical connector from the valve.
- (3) Release the clamps that attach the valve to the duct, and remove the valve and seals.
- (4) Install blanks to the valve and the ducts.

B. Installation

Equipment/Materials	Part/Item No.
Torque wrench 40-50 lbf.in. (4.52-5.65 Nm)	Local supply

- (1) Remove the blanks from the valve and the ducting.
- (2) Install serviceable seals, and attach the valve to the duct with the clamps; torque tighten the clamp-bolt nuts to 40-50 lbf.in.(4.52-5.65 Nm).
- (3) Reconnect the electrical connector to the valve.
- (4) Remove the safety clip and tag and close circuit breaker opened in paragraph 1.A.(1).
- (5) Do a functional test of the auxiliary heating valve.

C. Functional test

- (1) Start No. 2 engine (Chapter 71, POWER PLANT) and run at idle.
- (2) Hold the F/DK VLV switch on roof panel CG to OPEN, and make sure that the valve motors to the fully open position in 7 to 13 seconds.

WARNING: AIR LEAKS FROM JOINTS IN THE DUCTING WILL BE AT A HIGH TEMPERATURE. BE CAREFUL WHEN YOU EXAMINE JOINTS FOR LEAKS BY HAND.

- (3) Do a check on the valve joints, by feel of hand, for leaks.
- (4) Select and hold the F/DK VLV switch to CLOSE, and make sure that the valve motors to the fully closed position in 7 to 13 seconds.
- (5) Stop the No.2 engine (Chapter 71, POWER PLANT).

D. Close up

- (1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

EFFECTIVITY: 800XP

21-60-105

Page 201

Sep.02

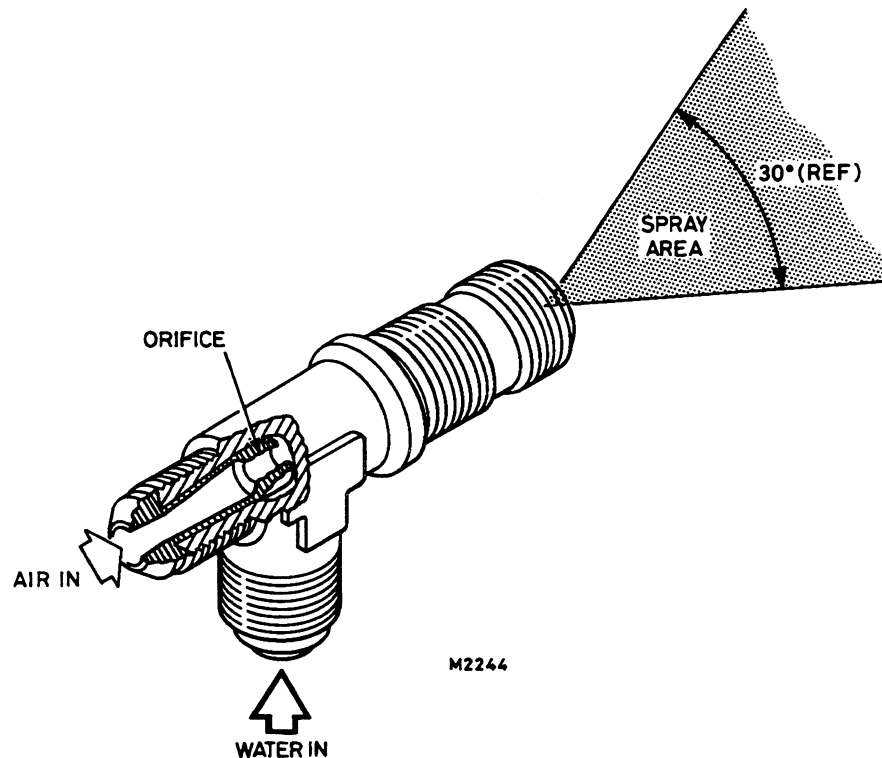
WATER INJECTOR NOZZLE - DESCRIPTION AND OPERATION

1. Description

The water injector nozzle has three ports, two inlet ports and an outlet port. One inlet port receives water and the other receives high pressure air. The air/water mixture is sprayed through the outlet port over a 30 deg. spray area.

2. Operation

The water injector nozzle is mounted in the ram air inlet duct near the secondary heat exchanger face. High pressure air is supplied to the nozzle from the air cycle motor (ACM) turbine inlet. This high pressure air is used to drive water, which is drained from the water separator, through the nozzle to form a spray. This gives increased cooling at the secondary heat exchanger.



Water injector nozzle
Figure 1

EFFECTIVITY:

800XP

21-60-110

Page 1

July 95